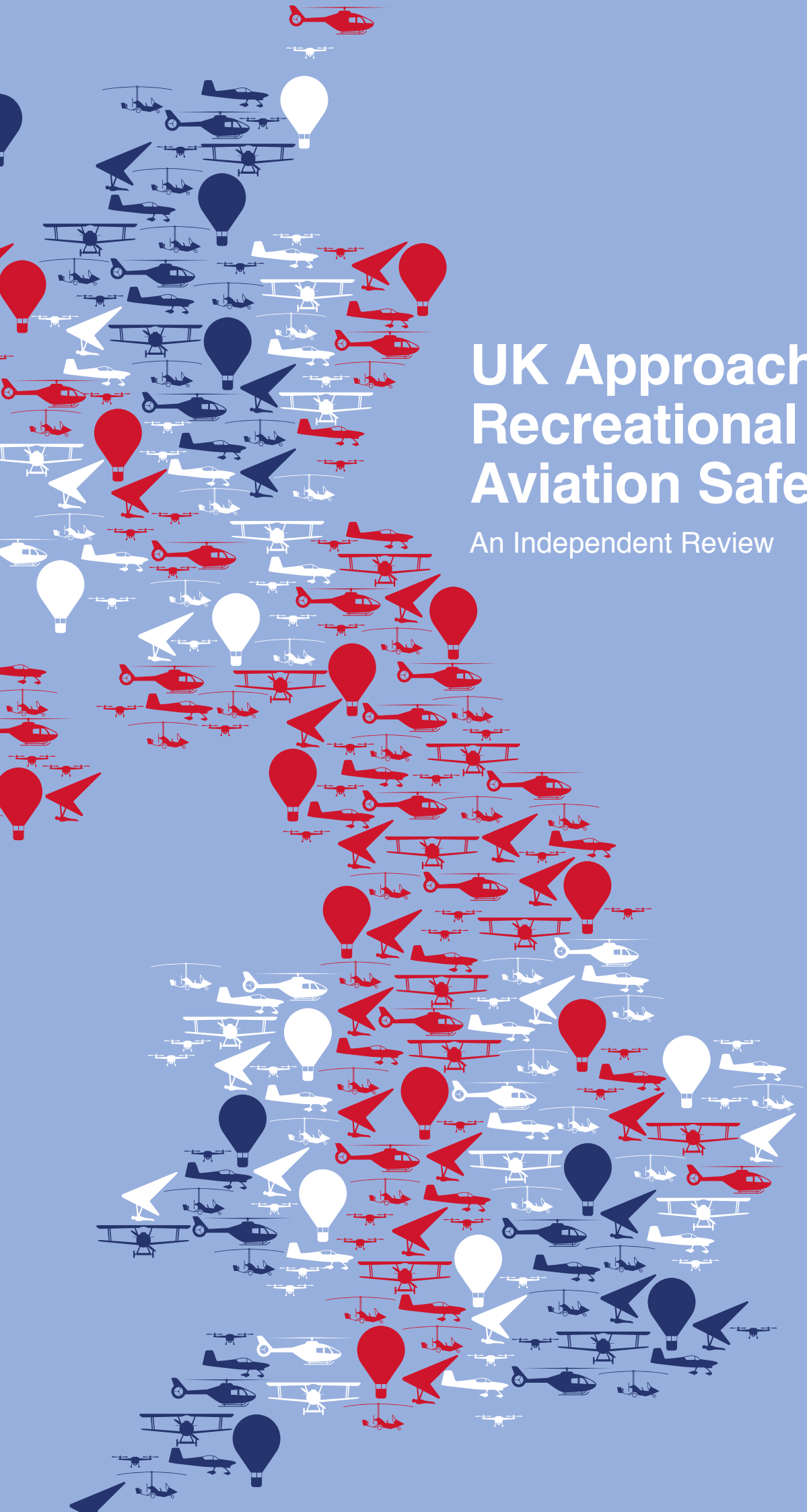


UK Approach to Recreational General Aviation Safety:

An Independent Review

Foreward by Geoffrey Podger – Independent Chair

It has been a privilege to be asked to Chair the 2019/2020 Independent Review into the UK Approach to General Aviation Safety and to present this draft outcome Report for consultation with interested parties, most noticeably members of the General Aviation Community.

Whilst my own contribution relates, as was the intention, to my wider regulatory safety experience and background, I could not have undertaken the task without the unfailing expertise, assistance and industry of Tony Rapson, until recently Head of the CAA General Aviation Unit. The report is therefore very much a jointly written document whilst I of course take the responsibility for the wider safety and contextual perspective.

The Report could also not have been written without the involvement of a large number of bodies representing the recreational aviation community who gave very freely of their time and expert knowledge. Similarly, the various Regulatory Bodies interviewed, both here and overseas, were generous in their involvement. The details of those we interviewed are at Annex A and they deserve our gratitude.

Finally, Tony and I would like to record our thanks to two CAA colleagues: John Dobbe who arranged our stakeholder engagements and Andrew Robinson who programme managed the task.

Geoffrey Podger

Consultation Arrangements

If you would like to provide comments on this review and its conclusions, then please write to us at GASafety@caa.co.uk by 24th April 2020. We will reply publicly to any general themes and issues which arise in the consultation.

Contents

Paragraph

[1] Aviation and Maritime Confidential Incident Reporting

1.0. Introduction

1.1. This Independent Review was commissioned and funded by the Department for Transport following a commitment to do so in the "Aviation 2050: The Future of Aviation" green paper which set out for public consultation a number of policy options to improve aviation safety. The review was initiated in July 2019 and will be completed with a response to this consultation on our work and conclusions set out in this document.

1.2. A copy of the full Terms of Reference for this review, together with short biographies for Geoffrey Podger and Tony Rapson, can be found at Annex B. We should stress at the outset that we are considering non-commercial operations focusing on sport, recreational and personal transport elements of General Aviation.

1.3. One thing that was apparent from the very start of this review was the extensive amount of work that has and continues to take place to maintain and enhance safety within the general aviation community as well as the development of a proportionate regulatory system for general aviation. It has not been possible to use anything but a small proportion of this work but where possible it has been referenced and links provided in the appropriate footnote.

1.4. The principles and detail of this review were discussed with and presented to stakeholders in the General Aviation community. A list of engagement activity is at Annex A. As required by the ToR we have set out the national and international regulatory framework at Annex C.

1.5. At the time of writing the new Government has taken up office and confirmed as its principle objective leaving the European Union on 31 January 2020. It will be a matter of political decision as to how the safety regulatory regime will be managed from 2021 onwards and the nature, if any, of future cooperation with the European Aviation Safety Agency (EASA) but it would seem likely at the very least that the UK will become responsible for more of EASA's current tasks and responsibilities for the General Aviation Fleet.

2.0. Recreational General Aviation: the approach to risk and safety

2.1. The motivation of the present Review is above all concerned with assessing the current level of risk in recreational aviation, whether this is acceptable, and whether further regulation or other measures are called for. It is clearly proper to do so given that recreational operation in the UK currently results in a number of deaths each year whereas UK large commercial air transport aviation operating on a much larger scale reports no deaths at all - a considerable achievement by the industry and the Civil Aviation Authority (CAA) as regulator.

2.2. However, as our Terms of Reference recognise the two aviation sectors are hardly comparable and "applying the same standard to private or non-commercial flying would, in effect, eliminate private flying as it would be impossible to achieve the levels of safety achieved by Commercial Air Transport in the modern age".[2] We found no evidence in discussion with both the aviation communities and the regulators here and internationally to contradict this statement. However, the main risks of general aviation are borne by those who voluntarily undertake the activity which inherently alters the acceptability of the risks which are incurred. Previous work around high-risk sporting activity[3] has shown that such risks have a level of acceptability which can be about 1,000 times as high as that of involuntary chosen societal risks. Moreover, it is clear that there is a higher tolerance of risks which the individual can control and indeed where at least a part of the attraction of the activity lies in being challenged by and overcoming the risks. Both the last two factors are clearly present in recreational general aviation.

2.3. Faced with the generally agreed propositions outlined above, regulators have tended to take a more relaxed view of risky activities which are entered into on a generally voluntary basis. Thus, the Health and Safety Executive issues guidance on the organisation of sporting activities but does not seek to inhibit individuals who wish to engage in high risk activity which does not put others at risk. Similarly, the Maritime and Coastguard agency operate a much less constrained regulatory regime for pleasure boats than for commercial shipping.

2.4. There are however two important caveats to the approach to high risk activities outlined above. The issue of third-party injuries and fatalities from any recreational activity does however raise very different issue of acceptability. Clearly it is one thing to voluntarily accept a risk and quite another to sustain death or a life changing injury as a result of an activity with which one has no commitment or interest. In assessing the measure of this problem, it is important to define precisely who is to be classified as a third party. Our view is that the proper approach in recreational civil aviation is that those who have chosen to be passengers or are otherwise voluntarily present in a known recreational higher-risk environment are considered participants and not uninvolved third parties.Our view is that the risk context should be apparent to those who choose to board planes used for recreational aviation. If this view is accepted, it should be noted that the actual level of third-party accidents is extremely low with 5 accidents in the last 40 years resulting in 16 fatalities with 11 of these being the result of one accident. That one accident was the Shoreham Air Display tragedy of 22 August 2015 when 11 people died. Significant further enhancements to civil air display regulation were introduced following Shoreham. We heard evidence that this has resulted in unwelcome restrictions on air displays (The restrictions being sometimes of a wholly voluntary character), but we consider that these are justified by the enhanced protection given to third parties. Hence, we have not considered any regulation relaxation in this area.

2.5. Secondly and in our view very importantly we need to recognise that the whole concept of "acceptable risk" is unavoidable for the decisions which public and private bodies, including regulators, must take. It does not mean however that we can simply "sweep under the carpet" the human tragedy of lives cut short or plagued by life changing injury even if the risk overall is managed at levels reasonably regarded as "acceptable" in the round by society as a whole. Hence, we have deliberately looked at the common features of recent accidents and considered whether further preventive measures are possible and if so whether these should be regulatory or voluntary in character.

2.6. Finally, we were asked to look at the comparative risk between recreational aviation and other high-risk sports activity in the context of best practice and regulation. The outcome of our research into this area is again set out below. It is however important to sound a warning note at the outset into reading too much into such comparisons. People do not approach risk on a mathematical basis and in consequence the level of risk which occurs in one field may be regarded as acceptable whereas the same level of risk in another will not be. Acceptability will very often be determined by other factors such as the history of a particular activity, its traditions and practice and changes in acceptability will very often result from serious accidents whose wider impact is such as to result in new restrictions.

[2]Study Terms of Reference para 3.5
[3]Fischoff et Al 1981

3.0. Assessment and Management of Risk in the General Aviation Sector

3.1. In this section we consider in detail the risk involved in general aviation to those who participate in it, both pilots and non-pilots and third parties not directly involved in general aviation activity.

3.2. In January 2018, under the State Safety Programme, the UK Aviation Safety Review for 2016[4] was published. The report intends to provide information about the level of safety in civil aviation and to promote aviation safety. The review compares aviation to other transport modes. Nevertheless, the General Aviation section stood in stark contrast at 21 fatalities for 2016 when compared to the zero for large commercial air transport or indeed for any other commercial section. Concern about this difference led to the statistics being highlighted in the Government's "Aviation 2050 – The future of UK aviation"[5] Green Paper consultation in December 2018 leading to the commitment:

"Given the accident rate in GA compared to the rest of the aviation system, the government is committed to continually seeking new and innovative ways to improve the UK's safety record across the entire aviation system…"

"…The government proposes to:

Review the UK approach to General Aviation safety to re-evaluate the risk picture and risk appetite…"

It is this link through the State Safety Programme with the requirement to set an Acceptable Level of Safety Performance (ALoSP) and the need to understand if general aviation is acceptably safe that has led to this review. The review enables general aviation to be compared to other recreational activities, so we can understand if its safety performance is more comparable to those activities rather than commercial air transport.

3.3. Control of Risk and Risk Hierarchy.

An EASA Working Paper – *"Roadmap for Regulation of General Aviation"*[6] was presented to the EASA Management Board in September 2012 and did much to pave the way for the regulatory changes that followed in the EASA programme of activity to deliver *"Simpler, Lighter, Better"* General Aviation regulation. Amongst other things the paper included a risk hierarchy:

> Uninvolved third parties

> Fare-paying passengers in commercial air transport (CAT)

> Involved third parties (eg airport ground workers)

> Aerial work participants / Air crew involved in aviation as workers

> Passengers ("participants") on non-commercial flights

> Private pilots on non-commercial flights

This hierarchy of risk is not so much the risk to each party but more about how those risks are managed and by whom. For the first two, the aviation system must provide an acceptable level of safety and this is achieved through extensive regulation and compliance. Not least the EASA regulatory framework and the UK Air Navigation Order through to the Rules of the Air which applies to all pilots and aircraft. After that the level of involvement in the management of risk which individuals can accept increases with the ability to choose whether or not to take part in that activity. In general aviation both pilots and passengers (participants) can choose not to undertake the activity / flight and either just forego the activity or travel by other means. The passenger of a general aviation flight, having elected to take part in the general aviation activity then has less control over the management of risk / conduct of the flight than the pilot and hence the pilot has both the greatest informed choice as to whether or not to take part in the activity and also the greatest involvement in the conduct of the flight and any and all risk associated with it. In keeping with the risk hierarchy above, this review will consider three groups, uninvolved third parties, non-pilot participants in general aviation activity (passengers) and the pilots[7].

3.4. Third Parties.

Most importantly the level of risk of any activity should not place members of the public at unacceptable risk.

3.4.1. Accidents remain inevitable as can be seen in part by the 235 pedestrians who lost their lives in transport accidents in 2018[8]. We have reviewed the 687 general aviation accidents[9] between 1978 and July 2019 to identify where there were uninvolved third-party fatalities. Over the 40-year period 5 accidents merited further consideration:

> 1985 Fordingbrige, Hampshire 1third party fatality

> 1987 Solent, Hampshire 5 fatalities (2 third party)

> 1998 Long Mynd, Shropshire 1 third party fatality

> 2009 Long Marston, Warwickshire 1 third party fatality (Police investigation only)

> 2015 Shoreham, West Sussex 11 fatalities

More detail on each of the above, including links to appropriate reports and investigations can be found at Annex D.

3.4.2. In terms of general aviation accidents there is nothing else on the scale of the tragic Shoreham Air Show crash and it is only right that the aviation system responded with detailed investigations and regulatory change to enhance the system to reduce even further the likelihood of similar accidents. Looking at the list in general there is no link between the 5 accidents that would suggest a trend. Whilst recognising the extensive work carried out in the aftermath of the Shoreham tragedy, it is very rare for general aviation activity to result in the death of uninvolved third parties. Recognising the significant work that went into the investigation and follow up of all these tragic accidents we have concluded that there is otherwise no need for additional work and/or mitigations to manage the general aviation risk to third parties but equally the enhancements put in place must be maintained.

[4] CAP 1595 UK Aviation Safety Review for 2016: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=8153

[5] Aviation 2050: the future of UK aviation: https://www.gov.uk/government/consultations/aviation-2050-the-future-of-uk-aviation

[6] Working Paper – Roadmap for Regulation of General Aviation: https://www.easa.europa.eu/sites/default/files/dfu/EASA%20MB%2004-2012%20WP09a%20GA-roadmap_mb.pdf

[7] As required by the ToR this review does not consider attendance at Air Shows further as this has been fully covered by the CAA's Air Display Review, the AAIB accident investigation and the DfT commissioned Review of UK Civil Flying Display and Special Event Governance. The last of these is linked: https://www.gov.uk/government/publications/review-of-uk-civil-flying-display-and-special-event-governance

[8] ONS Cause of Death V01 -V09 Pedestrians injured in transport accidents. ONS Searchable dataset: https://www.nomisweb.co.uk/query/select/getdatasetbytheme.asp?opt=3&theme=&subgrp=

[9] Scope of accidents consider: Non-commercial operations involving non-complex motor-powered aircraft: Fixed-wing aeroplanes with a certificated maximum take-off mass not exceeding 5,700kg; helicopters with a certificated maximum take-off mass not exceeding 3,175kg; Ex-military or historic aircraft. The following categories not included in the above: Gliders; gyroplanes; mircolights; airships and all ballooning operations.

3.5. Passengers – Non-Pilot Participants

3.5.1. In recreational or personal transport aviation that we are looking at here, passengers (participants) can choose not to undertake the activity / flight and either just forego the activity or travel by other means. Having elected to take part in general aviation activity then the passenger has less control over the management of risk / conduct of the flight than the pilot, this is reflected in the hierarchy of risk at 3.3. Passengers are required to be briefed by the pilot in command but are reliant on that information being correct if they are to be better informed over and above the self-evident fact that a GA aircraft and pilot is not presenting the same level of risk as a commercial air transport aircraft and commercial pilot. It is right that passengers are placed above pilots as they are different from the pilot on non-commercial flights because in general they do not have the same ability to assess and control the risk as the pilot. But aircraft occupants (other than the pilot) include a broad spectrum of stakeholders of different ability to assess and control risk. eg the occupant may be a friend of the pilot, or it may be an aircraft co-owner who is equally qualified to be pilot-in-command of the aircraft. Without being present at the pilot briefing or other exchanges between pilots and passengers, it is not possible to make an assessment of the quality of that exchange. The exception to this is where cost sharing flights are arranged via an internet platform operating in accordance with the EASA Charter where significant and clear information is 'pushed' to the passengers / participants.

3.5.2. We considered a recommendation around briefing and/or providing written material with a signature requirement to passengers on non-commercial flights but in the end concluded this would be a protection of the regulator rather than providing any additional practical protection to passengers. A well-managed and correct flight will already include the necessary information to enable a passenger to decide as to whether or not to participate, and the addition of formal generic briefing from the regulator will add little and likely be just a 'tick box' exercise. For poorly conducted flights, or flights where the pilot is already operating outside the law, any guidance is likely to be ignored. Providing more information on the CAA Website is highly unlikely to lead to significant improvement on the assumption that if a passenger already knows enough to check the CAA Website they are already better informed than average! For now, it is appropriate that the situation on non-commercial flights continues to be monitored and if any trendsare identified specific action is taken.

3.6. Pilots

3.6.1. The pilot of a non-commercial general aviation flight is the best informed to understand the risks of their flight in their aircraft as well as being the person who can manage that risk most effectively. We have not identified any additional regulatory action that would lead to a further improvement of the management of risk but more and even better education and training can lead to improvements. Whilst we do not believe it appropriate to mandate more training given the current level of risk within this recreational activity, the benefits of post ab initio training, whether that is formal ratings such as the Instrument Rating or via one of the associations' post qualification development programmes, has considerable merit in raising experience and awareness above the basic level achieved at the end of initial training.

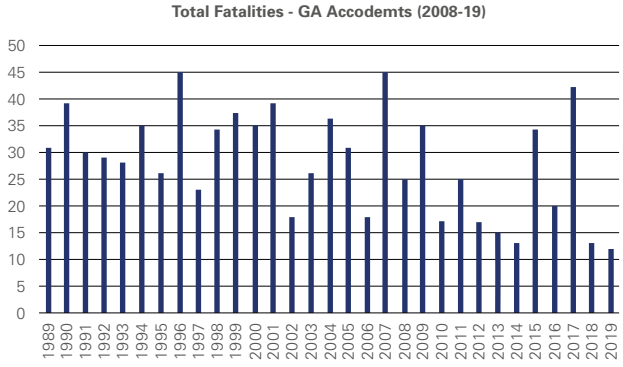
3.6.2. We recognise the importance of continuous training and skills development for private pilots, to improve the safety standards of flying. This can be arranged between individuals or via training organisation and associations. The CAA has developed the Pilot Recognition for Operational Up-Skilling and Development (PROUD) scheme[10] to highlight some of the opportunities and the organisation providing them for ongoing improvement. Other training and development could involve obtaining more ratings or attending safety events. Whatever the activity, the benefits of investing time in further training and skills development and indeed taking on board comments from fellow flyers, will improve experience and decision making.

3.6.3. Whilst general aviation has undoubtedly benefited from safety enhancements from the technical advancements in aviation, the other eras of aviation evolution apply much less to general aviation. We must continue to work to maintain and where possible improve safety in general aviation. Safety needs to be improved in a proportionate way that does not just stop the activity through making it too difficult or too complex to do or just too expensive. Whilst commercial aviation rightly focuses, amongst other things, on "…understanding the interplay of organizational and managerial factors in accident causation… … to protect against fluctuations in human performance or decisions at all levels of the system"[11] for general aviation it is often only the pilot, their experience, currency and competency that forms the barrier between normal operations and an accident. It is important that general aviation focuses on active failures which are the actions, including errors and violations, which have a significant adverse effect. Such failures are generally associated with front-line personnel (pilots, air traffic controllers, aircraft mechanical engineers etc) and can result in accidents and leads to the conclusion that the majority of GA accidents are as a result of pilot decision making and actions.

3.7. Safety Record:

For this section we considered the fatal accidents in general aviation[12] from 1989 to 2019 to give 30 full years of data, prior to 1989 confidence levels in the data available reflecting the true picture decreases. This gives an average annual fatal accident rate of 17.

3.7.1. The CAA tracks a ten-year moving average fatal accident number to compare in year accidents. The current annual 10 year moving average fatal accident rate is 1.33 per 100,000 flying hours. The graph below shows the fatalities (rather than the fatal accidents) over that 30-year period.



[10] https://www.caa.co.uk/General-aviation/Safety-information/Be-PROUD-and-keep-learning/
[11] ICAO Doc 9869 para 2.3.4
[12] Scope of accidents considered: Non-commercial operations involving non-complex motor-powered aircraft: Fixed-wing aeroplanes with a certificated maximum take-off mass not exceeding 5,700kg; helicopters with a certificated maximum take-off mass not exceeding 3,175kg; Ex-military or historic aircraft. The following categories not included in the above: Gliders; gyroplanes; mircolights; airships and all ballooning operations.
[13] Link to GASCo Website: https://www.gasco.org.uk/about

3.7.2. There can be significant difference from year to year and this is not just down to the number of fatal accidents in a given year but also how many people were on board the aircraft involved in the accident. The General Aviation Safety Council (GASCo)[13] and all the other general aviation associations track and monitor accidents to identify trends, learn lessons and publish any findings. This is in addition to any work, reporting and recommendations made by the Air Accidents Investigation Branch (AAIB). Similarly, the CAA considers carefully all accidents and works to identify any trends.

3.7.3. It remains difficult to identify or rule out trends in what, despite the individual tragedy of each accident, is a relatively small number of accidents overall. This challenge increases even further when it is spilt out into the subsectors of the GA community: aeroplane, helicopter, ballooning, gliding, gyroplanes and microlights. To consider the context of the general aviation safety record we considered information provided by the Office of National Statistics (ONS). The searchable ONS data set for the 10-year period 2008 to 2017 was considered and looking at this data general aviation fatalities were less than 0.2% of all UK accidents and 1.2% of all transport accidents. Using the ONS [14] statistic and searchable datasets it was difficult to find a simple comparator to general aviation. The ONS does recorded deaths by submersion in water (swimming pool and natural water) as deaths as a result of falling into water are recorded separately it can be assumed that the vast majority of these deaths are individuals who chose to enter the water for swimming or other recreational purposes. The ONS dataset covers the period 2013 to 2018 inclusive recording 367 fatalities. For general aviation accidents the number of fatalities were 137 (37.3% of those for submersion in water). The Insurance Information Institute (for the USA), sets out the risk ("odds of death") in the United States by selected cause of injury which further highlights the relatively lower risk associated with aviation compared to other factors of life[15].

3.7.4. Whichever set of statistics are considered, or comparisons used general aviation does not appear to be any more dangerous than other recreational activities that people choose to take part in. It follows that as long as participants are reasonably informed there is no reason to further restrict access to general aviation for those participating in this activity as pilots or passengers.

3.8. The effect of Red Tape Challenge / Regulatory change for GA.

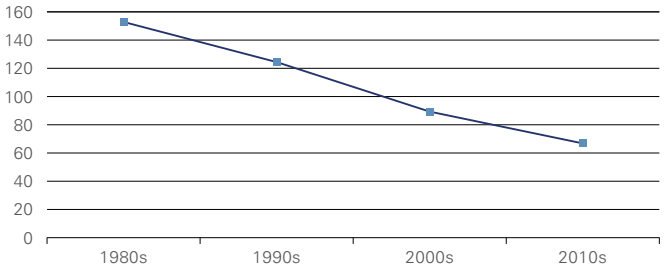
Changes as a result of the Red Tape Challenge and from the EASA GA Roadmap started to be made in 2014. Looking at the ten-year average for fatalities they are 2009 to 2018 – 23.1, 1999 to 2008 - 32.6 and 1989 to 1998 – 32. Although there were peaks in 2015 and 2017 the overall trend for the last decade is downwards but this trend should be monitored. There was no evidence of the recent regulatory changes leading to an increase in the fatality rate although we would have to acknowledge that the time period between change and effect is currently very small, it will therefore, be important to monitor the accident rate over time to establish if there is any change in trends either positive or negative.

3.9. USA Study into fatality risks in transportation.

In January 2013 the Department of Economics and the Transportation Centre, Northwestern University, published its comparison of "the fatality risks in United States transportation across modes and over times".[16] Although it would be wrong to assume the results in the UK would be exactly the same, the broad trends are the same, as can be seen from the information on the Office of National Statistics website and database. The USA study is helpful in that it sets out the risk of aviation (both commercial and private) compared to other transportation means and concludes aviation, particularly commercial aviation, remains one of the safest ways to travel.

3.9.1. In response to the work on this GA Safety Review, John Thorpe supported by GASCo submitted his review of GA fatal accidents. The full paper can be seen at Annex E. Amongst other things, using four decades of data the number of fatal aeroplane accidents per decade reduces between 17% and 25% as shown in the table below. These figures further support the view that the recent regulatory changes and alleviations have not had a negative impact on safety. The paper concludes that the steady downward trend reflected in the table below almost certainly reflects the safety influence resulting from the work, individually and working together, of the CAA, the relevant organisations and associations and others including the General Aviation Safety Council (GASCo) and supports continued work on the many safety initiatives to continue this safety improvement. The paper also suggests that changes in legislation are unlikely to have any effect and that it would appear that education is the best way to influence safety. The above view aligns with the approach to GA Safety promotion taken in (not least) the USA, Australia and by EASA.

Fatal Accidents World Wide to UK Registered Aeroplanes of 5,700kg and Less*, excluding Microlights



***Includes** self launching (touring) motor gliders

3.10. A Fatal Injury Accident Comparison by State – 2008-19[17] was completed by the CAA. The full comparison, which can be seen at Annex F, includes a comparison of fatal injury accidents rates, expressed as a rate per 100,000 flying hours for General Aviation non-commercial activity between 2008 and 2019. The fatal accident rates are:

Australia	1.86
USA	1.52
New Zealand	1.40
UK	1.20

In all the comparators used the UK compared favourably with other regulatory regimes for general aviation. Additionally, the UK also compared favourably in terms of a wide range and delivery of safety initiatives and safety actions by both the regulator and associations.

3.11. Safety Initiatives and Safety Action

There are a vast array of safety initiatives and actions at the international, national, association and local level and it would be impossible to cover them all in this review. Where appropriate links to websites have been provided in the footnotes throughout this review to the various safety initiatives. This section covers some of the key work and examples.

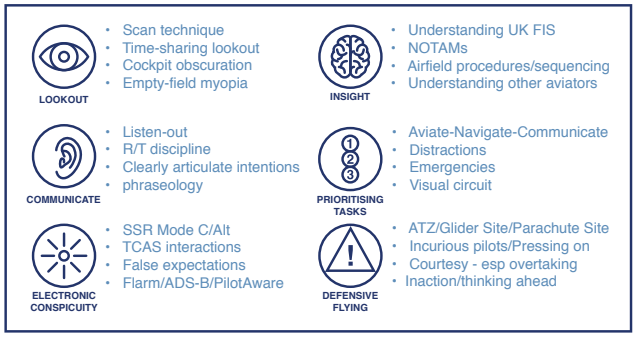
[14] https://www.ons.gov.uk/
[15] Insurance Information Institute – Facts + Statistics: Mortality Risk: https://www.iii.org/fact-statistic/facts-statistics-mortality-risk
[16] Comparing the fatality risks in United States Transportation across modes over time: http://faculty.wcas.northwestern.edu/~ipsavage/436.pdf
[17] Date Range used 1 January 2008 to 31 August 2019 (where available).
[18] AAIB Website: https://www.gov.uk/government/organisations/air-accidents-investigation-branch

3.11.1. Air Accident Investigation Branch

The work of the Air Accident Investigation Branch has been and remains crucial to the ongoing education and lesson learning from accidents. Broadly speaking our work and thinking during this review aligned with the Branch's work and conclusions. In this area of GA, we are often dealing with relatively inexperienced pilots operating in a relatively low regulatory environment making continued education and development important. They also highlighted, amongst other things, that there were a significant number of accidents involving short or narrow strips and often involving pilots who had not flown at that location before. This is one example of the wider challenge we have found of supporting pilots better in their decision-making process. It was suggested that general aviation pilots might benefit from a simple tool to support their pre-flight risk assessment. Such tools are available in the commercial world and could probably be adapted for the non-commercial environment. The positive contribution that new technology can make and the need to use it was acknowledged, as was the need to manage new risks such technology may introduce. Our engagement with the Branch confirmed that there was a common set of safety information and we had identified the right cause of accidents. They also highlighted the importance of good, simple, clear safety information particularly mentioning the CAA Safety Sense leaflets. More information can be found on the Air Accident Investigation Branch Website[18] which is an invaluable source of safety information both individual accident reports and Annual Safety Reviews – on their website follow the links to "AAIB Publications".

3.11.2. United Kingdom Airprox Board (UKAB)

The UK Airprox Board's primary objective, as taken from their website[19], is to enhance air safety in the UK, particularly in respect of lessons to be learned from Airprox occurrences reported within UK airspace. An Airprox is a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised. Amongst other things they publish the 'Blue Book' which is the Annual Airprox Summary Report. The report for 2018[20] includes a section on Airprox Education Themes and sets out 6 key safety themes at page 14, the table for which is reproduced below, and page 24 where more detail is set out.



3.11.3. UK Flight Safety Committee[21] and CHIRP[22]

Both the UK Flight Safety Committee and CHIRP (Aviation and Maritime Confidential Incident Report) play key roles in the safety system for general aviation. Both were comfortable with the overall levels of safety achieved but highlighted particular safety initiatives and areas of activity for them and others. Both mentioned airspace in the context of mid-air collisions risk and electronic conspicuity which are being considered and managed under the DfT and CAA Airspace Modernisation Strategy so are not addressed in this report.

3.11.4. Associations

All the associations have a safety focus and all of their magazines and other publications include one or more safety features. A lot of this work is brought together and considered by the General Aviation Safety Council (GASCo)[23] who continue to do considerable work on general aviation safety. GASCo uses information from all the associations and the CAA and EASA on Safety issues and emerging themes to ensure their work remains focused on current issues. More detail can be found on the GASCo website linked in the footnote. Of note is their work under contract to the CAA to deliver safety evenings as part of its safety advice and its delivery of safety education and training. Such an approach aligns with best practice in other states as can been seen by the Aviation Safety Advisors (ASA) role set up by the Australian Government's Civil Aviation Safety Authority (CASA)[24] which shares many of the same goals and deliverables of GASCo.

3.11. 5. Gliding Safety

One example of a good safety approach is that achieved by the British Gliding Association (BGA). (This has been included as an example, there will be other examples equally worthwhile, but they have not all been covered here.) One of the BGA's specific safety initiatives was Safe Winch Launching which was introduced nationally in 2006 and included the following new methodology:

> Establish a comprehensive accident and incident database (the BGA database contains all 7000 reports since 1974)

> Identify the major hazards from the accident data

> Fill gaps in the theory

> Create simple and universal guidance for keeping safe

> Educate all pilots and instructors

> Measure results

> Feedback results to everyone

3.11.5.1. This methodology was subsequently applied to other gliding safety initiatives. The tables below show how BGA overall and winch accidents have diminished since 2006.

3.11.5.2. These safety improvements are not down to regulation but occurred through non-regulatory expert intervention and education. The involvement of recognised experts is one of the factors that makes it easier to get buy-in and change behaviour rather than just setting more rules.

3.11.5.3. The BGA provided a historic review that the European Gliding Union (EGU) completed some ten years ago showing where the UK (BGA) sat in the overall rankings. The summary table is included below, and the full review linked in the footnote[25]. The UK's performance has improved much in the past ten years.

[19]UK Airprox Board website: https://www.airproxboard.org.uk/home/
[20]Analysis of Airprox in UK Airspace Report Number 34 Jan – Dec 2018: https://www.airproxboard.org.uk/uploadedFiles/Content/Standard_content/Analysis_files/Book%2034-final.pdf
[21]UK FSC Website: https://www.ukfsc.co.uk/
[22]UK FSC Website: https://www.ukfsc.co.uk/
[23]GASCo Website: https://www.gasco.org.uk/
[24]Civil Aviation Safety Authority – Aviation Safety Advisors: https://www.casa.gov.au/education/aviation-safety-advisors-asa
[25]European Gliding Union Accident Statistics dated 2008: https://www.alter.si/tabla/files/753901-EGU_ACC-Note-09.pdf

3.11.5.4 BGA fatalities in 14-year periods (glider, Touring Motor Glider, towing aircraft)

14-year period	Fatalities
1978-1991	84
1992-2005	72
2006-2019	30

3.11.5.4. BGA fatal and serious winch injuries in 14-year periods

14-year period	Fatalities	Serious injuries
1978-1991	18	38
1992-2005	13	28
2006-2019	4	5

Fatal Accident rates - Gliding

The following table shows in descending order, the number of fatal accidents per 100,000 launches over the ten year period 1989-2007 (but Austria is a 9-year average 1997-2005, and Finland is 10 years 1997-2006). Ireland and Serbia are excluded due to a statistically low 'populations'.

		1998-2007 10 year	1998-2007 10 year	1998-2007 10 year	1998-2007 10 year
Fatal Accident rate order		Total Fatal Accidents	Average Fatal Accidents p.a.	Average Launches p.a.	Average Fatal Accident Rate per 100k launches
Switzerland		32	3.20	97,274	3.39
Poland		10	1.00	29,703	3.37
New Zealand	5 years 2003-2007	6	0.60	21,738	2.76
France		46	4.60	187,215	2.46
Austria	9-year average 1997-2005	21	2.33	97,275	2.40
Belgium	Part of Belguim only	4	0.40	20,261	1.97
USA Rough	Rough estimated launch #s	59	5.90	440,000	1.34
Germany	Estimated launch numbers	136	13.60	1,019,878	1.33
UK		37	3.70	338,673	1.09
Norway	Estimated launch numbers	1	0.10	11,550	0.87
Denmark		5	0.50	60,268	0.83
Sweden		4	0.40	54,936	0.73
Czech Republic		5	0.50	82,019	0.61
Slovakia		1	0.10	17,098	0.58
Netherlands	Estimated launch numbers	7	0.70	132,800	0.53
Finland	10 years 1997-2006	0	0	34,072	0.00
Overall totals		375	37.73	2,641,759	1.76

Apart from Poland, the five highest fatal accident rate European countries (and New Zealand) all have alpine mountain flying, which indicated a possible correlation in terms of risk. They are also areas which visitors from other 'flat' countries go, and the visitor fatal accidents are included in the analyses.

The nordic countries. Czech Republic, Slovakia and The Netherlands have the lowest Fatal accident rates at <1.0 per 100k Launches.

4.0. Delegation and Deregulation

4.1. In November 2013 the CAA set out its response to the Government's General Aviation Red Tape Challenge heralding a change in approach to the regulation of GA and setting up a GA Unit to focus "entirely on the GA sector to ensure that the regulatory regime for the GA sector will take a different path and be less onerous to that applied to the commercial aviation sector".[26] It was in that document that the CAA set out its intentions for the regulation of GA that is now articulated as the 4 guiding principles for the work of the GA Unit and the CAA to:

> Only regulate directly when necessary and do so proportionately

> Deregulate where we can

> Delegate where appropriate

> Not to gold-plate, and quickly and efficiently remove gold-plating that already exists

4.2. There has been significant progress in all these areas, both for the regulation the CAA is directly responsible for and progress achieved within in the EASA GA Roadmap work to ensure all UK pilots, whether operating under direct UK Regulation or EASA Regulation get the benefits they deserve. There is a need to ensure that any new rules are proportionate and effective for general aviation. More delegation is possible, and both the CAA and Government are open to further delegation if desired as set out in the Aviation 2050: The Future of UK Aviation.[27] There was an appetite for further delegation, mostly within existing approvals but these were either already in hand or yet to be scoped out by the associations. It was recognised that there may be some scope under the new Basic Regulation for formation of Qualified Entities. The community was confident if they wanted more delegation or wanted to pursue specific rule changes that this can and should be initiated via the GA Partnership or direct with the CAA. It is important that the DfT, the CAA and the GA community remain open to the possibilities of greater delegation.

[26]CAP 1123 CAA Response to the GA Red Tape Challenge: http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=5838
[27]Aviation 2050: The future of UK Aviation, Para 7.33: https://www.gov.uk/government/consultations/aviation-2050-the-future-of-uk-aviation

4.3. Deregulation.

There has been significant success in the last 5 years with deregulation, taken here as the removal and/or the significant reduction of regulatory requirements but ultimately what is possible is in part limited by the UK's need to comply with international agreements and treaties. The highlights in this area include:

> The deregulation of single seat microlights under 300kg from all airworthiness requirements.

> The removal from the Commercial Air Transport Rules for paid for flight in historic aircraft under the CAA's Safety Standards Acknowledgement and Consent framework and approval.

> The removal of the requirement to hold a medical certificate provided the pilot meets the DVLA Ordinary Driving Licence standard and makes a declaration to that effect.

> A lifting of the absolute ban on Permit to Fly aircraft not being able to fly in IMC. This is now permitted provided the aircraft is assessed as appropriate via the Light Aircraft Associations process.

> Allowing paid for flight training in group owned aircraft

> The introduction of "E Conditions" to allow aircraft development and improvement without complying with all the airworthiness requirements during the development stage.

4.4. Delegation.

There has also been significant progress in this area

> Gyroplane Certificate of Validity issues delegated by CAA

> Reduced requirements for weighing of microlights

> Delegations to BMAA and LAA via A8-26 approvals

> Delegation of issue of Initial Permits to Fly to BMAA

> The issuing of National Private Pilot's Licences on behalf of the CAA by the British Microlight Aircraft Association (BMAA)

> LAA undertaking of airworthiness oversight of Yak and Nanchang aircraft.

Perhaps more importantly for the future is the the CAA Approval of Organisations Supporting Recreational Aviation – the A8-26 Approval which can be found in CAP 553 British Civil Airworthiness Requirements Section A (Chapter A8-26 on page 601 of 612).[28] It is this approval, now held by both the British Light Aircraft Association (BMAA) and the Light Aircraft Association (LAA) that underpins any delegations and key in demonstrating that the organisations are both appropriate and have the necessary competence to carry out the delegations.

4.5. Qualified Entities.

The new EU/EASA Basic Regulation updated the rules on Qualified Entities meaning that sport and recreational aviation associations could become Qualified Entities (QE) and take on certain roles and responsibilities. (As part of the Brexit process these rules will transition into UK law so will be available post the UK exit from the European Union.) Previously organisations that had a financial interest in the activity were barred from being QEs – something that did and still does make sense in commercial aviation but was an unnecessary blocker of non-commercial flying.

5.0. Regulatory Oversight

5.1. Function and scope.

Over the last 5 years the CAA, including the GA Unit, has been transitioning to Performance Based Regulation and away from a pure compliance model. It is this change that has helped support the implementation of the approval of organisations supporting recreational aviation set out above. It also included the setting up of the CAA's Regulatory Safety Management System (RSMS) and the associated Safety Review Panels including one for General Aviation and chaired by the Head of the GA Unit. More information on the RSMS can be found on the CAA's Website.[29]

5.2. Regulatory Intervention.

Where evidence comes to light, either through routine regulatory oversight, or by other means that organisations or individuals are not complying with the regulations then the CAA has to consider what actions are appropriate. In terms of routine oversight of organisations then there is a tried and tested system of highlighting and discussing the issues, agreeing the corrective actions and then completing the same in a reasonable timescale. In the GA Sector it is very rare that approvals have to be suspended and is very much a last resort. Similarly, in its intervention concerning individuals, suspension and/or revocation of licenses was rare and only after clear evidence had been gathered. Even where such action was taken the individual still has a right to request a review of any and all decision making via the CAA's Regulation 6 review process.[30]

5.3. Enforcement.

The main purpose of the CAA's enforcement role is to protect consumers and the public through compliance with the rules applicable to civil aviation and to deter non-compliance. Although enforcement can include regulatory action and/or a prosecution, prosecutions have to meet the same evidential standard and public interest test as any other criminal prosecution as well as the charge needing to be proved to the court beyond reasonable doubt. No prosecution is undertaken lightly but such action remains an important tool of last resort in the CAA regulatory approach. More detail on the CAA's enforcement activity can be found on the CAA Website.[31] There has been recent public and media interest, as well as ongoing challenge from the Business Aviation / Air Charter market concerning illegal public transport and the role of cost sharing flights in that narrative. Given this more detail on cost share flights has been set out and discussed at Annex G. We have not recommended any change to the present requirements.

[28]CAP 553 BCAR Section A – A8-26: https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=220
[29]CAA Website – CAA Regulatory Safety Management System: https://www.caa.co.uk/Safety-initiatives-and-resources/How-we-regulate/Safety-Plan/Enhancing-CAA-oversight/CAA-regulatory-safety-management-system/
[30]CAP 1048 Guidance for applicant: Conduct of reviews of decisions or proposals made by the CAA Safety and Airspace Regulation Group: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=5616
[31]CAA Website – Enforcement and Prosecutions: http://www.caa.co.uk/Our-work/About-us/Enforcement-and-prosecutions/

6.0. Other Comparisons:

6.1. Below we look at a direct comparison with the work of the Maritime and Coast Guard Agency and the emerging work of the FAA in America concerning their Experimental Category and national regulated aircraft.

6.2. Maritime and Coast Guard Agency and the National Water Safety Forum.

There are some useful parallels between the work of the CAA as a Safety Regulator and the Maritime and Coast Guard Agency work in their environment. Although their legal definition of commercial activity is very different to that used in international aviation they too find the boundary between commercial and non-commercial activity not always clearly understood by participants and requiring regular re-enforcement. The non-commercial element of their remit is without registration or direct regulation and the safety levels achieved are not driving demands for greater regulation across the board. Fatal accident statistics are collected, collated and published for all deaths in water by the National Water Safety Forum[32] , a voluntary association of organisations including sports governing bodies, rescue services, regulators and harbour authorities, local government, utilities and other representative groups. The Forum is hosted by the RoSPA who provide technical and administrate support. Although they look at all water deaths the principles used are very familiar to the general aviation environment: "…Each of these activities and their associated risks in turn involve a number of different persons or organisations with responsibilities or interests ranging from participants in water related activity, to responsibilities for managing a facility or waterspace. Devising safety management arrangements which are fair, proportionate, and consistent for all these stakeholders can be complex and achieving a consistency of approach across the range of water-related activities even more so".[33] The accident statistics are published via the Water Incident Database (WAID).[34]

6.3. Whilst the total fatality figures concerning all deaths in water were significantly higher than in general aviation[35] when those concerning water borne craft are considered then the numbers are similar to general aviation. Importantly, whilst there is not an across the board drive for greater regulation all the organisations involved strive to decrease the number of fatalities by lesson learning from those accidents and wider education and training. The National Water Safety Forum's "Water Safety Principles ",[36] the Water Incident Database (WAID) and The UK Drowning Prevention Strategy[37] are just three examples of their work that has clear parallels to work completed in the general aviation community. It appears that by different routes the community of pleasure boating and general aviation both strive to reduce accidents and manage risk whilst recognising the right of people to take part in those activities with the minimum necessary level of formal regulator or government intervention. The challenge for both communities is the delivery of a fair, proportionate and consistent safety system that delivers an appropriate and effective level of risk management.

6.4. The Federal Aviation Administration of the United States of America – Experimental Category.

This section looks at the nationally regulated aircraft and the much talked about American Experimental Category. The best explanation of the American system we found was an article by Tom Hoffman in the November/December 2018 FAA Safety Briefing – The Experimental Experience.[38] As well as setting out how the certificated and non-certificated aircraft differ it also sets out some of the FAA's concerns about the understanding of the category: "Despite its great importance to experimental flying, Leahy notes the Order is not always well known in the community… …rule number one for flying an experimental aircraft is that you must comply with all the operating limitations on that special airworthiness certificate. If you don't you are in violation of part 91 operating rules… "[39] Overall the article sets out a system that is subtly different from that in the UK or indeed elsewhere in Europe. Given the amount of time and detail available to us it was not possible to establish if overall the system was better or only different. Certainly, some of the difference and engagement with the FAA are as a result of the legal construct and the funding of the FAA enabling the FAA to take on a greater role without passing on all costs to aircraft owners. It is clear that the regulation of the nationally regulated American fleet is entering a period of significant change. "The FAA is in the early stages of rulemaking to modernize provisions for issuing special airworthiness certificates. The Modernization of Special Airworthiness Certification (MOSAIC) intends to address barriers to new entrants and current aircraft owners and provide a smoother continuum of entry points into aviation, operating purposes, and operating privileges… …For the experimental market, MOSAIC proposes to segregate the current purposes for issuing experimental certificates into those that involve experiments and others that simply represent operation in the NAS (National Airspace System)".[40] Amongst other things the MOSAIC rulemaking task is looking at the expansion of the Light Sports Aircraft (LSA) category which would enable far greater use of aircraft coming under the LSA regulatory framework than currently under the Experimental Category. The work on the LSA looked very similar to the current work in the UK to consider if greater use could be made of Permit to Fly aircraft. More detail on MOSAIC from the user perspective can be found on the American Experimental Aircraft Association (EAA) website[41] using the search word "MOSAIC".

[32]National Water Safety Forum Website: https://www.nationalwatersafety.org.uk/
[33]National Water Safety Forum Website Principles: https://www.nationalwatersafety.org.uk/about/principles/
[34]National Water Safety Forum Website WAID: https://www.nationalwatersafety.org.uk/waid/
[35]The figure for all deaths in water from the National Water Safety Forum are consistent with the information from the Office of National Statistics
[36]National Water Safety Forum Website – Water Safety Principles: https://www.nationalwatersafety.org.uk/media/1151/water-safety-principles.pdf
[37]National Water Safety Forum Website The UK Drowning Prevention Strategy: https://www.nationalwatersafety.org.uk/media/1005/uk-drowning-prevention-strategy.pdf
[38] FAA Safety Briefing November/December 2018 starting on page 9 – The Experimental Experience: https://www.faa.gov/news/safety_briefing/2018/media/NovDec2018.pdf
[39] FAA Safety Briefing November/December 2018 last paragraph page 10 – The Experimental Experience: https://www.faa.gov/news/safety_briefing/2018/media/NovDec2018.pdf
[40]FAA Safety Briefing November/December 2018 righthand column page 12 – The Experimental Experience: https://www.faa.gov/news/safety_briefing/2018/media/NovDec2018.pdf
[41]EAA Website Search "MOSAIC": https://www.eaa.org/eaa/search?term=MOSAIC

UK Approach to Recreational General Aviation Safety: An Independent Review

Conclusions and Recommendations

UK Approach to Recreational General Aviation Safety: An Independent Review.

Conclusions and Recommendations

1. We consider that the current safety level of recreational GA is acceptable viewed in terms of its unavoidably greater risk than commercial aviation, the much higher risk acceptability of voluntary activities and in comparison, with other high-risk activities;[42]

2. We believe that it is nevertheless right to seek to reduce further the current level of serious accidents, given that the evidence shows clearly that it is human factors which lie at the root of the majority of accidents in this area. We do not however believe that further regulation in this area would be justified given the current level of accidents nor necessarily effective. We have not found that comparisons can easily be made between regulation and good practice in other higher risk activities given the essentially individualistic character of recreational aviation;[43]

3. We do believe that the best chance of reducing accidents is by encouraging an expectation that pilots will undertake periodic training throughout their flying careers in the sector both through voluntary attendance at refresher or further development training sessions and through the current initiative to bring about, through guidance, a more structured approach to the requirement to fly every two years with an instructor;[44]

4. We have not found enthusiasm for setting a target level of risk and would caution against this as it is unlikely to be effective in a sector where maintaining safety standards is essentially a solely individual rather than mixed individual / corporate responsibility[45]

5. Notwithstanding the above, we do believe that the CAA will need to monitor safety trends in this sector. Should there be a significant rise in the trend and if nature of the accidents continues to largely at least have human factors as its cause, then we believe the case for making continuous development obligation should be examined. It is important that it is the trend that is monitored and not the inevitable year on year changes that will happen when dealing with relatively small accident numbers as here;[46]

6. We have looked carefully at the risks to third parties from recreational GA. There is rightly much lower public acceptability of injury or death occasioned by high risk activity in which those who suffer had no choice or wish to be involved. We have looked carefully at such incidents and separated out those who in effect had chosen to participate not just as pilots but also as passengers and "on the ground" participants. We accept that this may be a controversial view but believe that the risks to these groups should be as clear as is the obvious enjoyment to be derived from participation. With such participants excluded, we note that third party casualties from purely recreational GA (see (8) below in relation to airshows) are in fact very low and, whilst of course regrettable, are tolerable in terms of the involuntary risks from the mistakes of others to which we are all exposed;[47]

7. On a related point, we have considered whether there is scope for further notification to passengers of the potential risk of a GA recreational flight. Given that there is already a requirement for a passenger safety briefing prior to each flight, which we believe is generally observed, this could only be added to by a requirement for written acknowledgement by the passenger. We do not believe this would be justified at present safety levels or in reality make any further impact;[48]

8. We have reconsidered the safety of air displays to both the participating and to genuinely "third party "non- participating individuals. In doing so we were naturally much influenced by the Shoreham disaster. It was put to us by some that the further restrictions, both regulatory and voluntary, introduced after that event had had an undesirably restrictive influence on the number and content of air displays. Our view however was that the facts of the Shoreham incident and its death toll could only lead to the conclusion that the regulatory changes to enhance safety introduced after the Shoreham display were justified and proportionate. In consequence we would recommend no change and support the conclusions of the DfT's "Review of UK civil flying display and special event governance."[49]

9. We considered the impact of delegation and the response of the CAA to the red tape challenge to see whether there had been any adverse impact on recreational safety but found no evidence for this although, again, continued monitoring by the regulator would be normal good practice;[50]

10. We asked extensively whether there was a desire for further delegation of activities currently carried out by the CAA. A number of organisations representing different activities within this sector, did indicate that they had further ambition for further delegation, but all were content that this could be managed through the normal channels for discussion with the CAA;[51]

11. The issue of cost sharing was a specific part of our terms of reference in terms of passenger protection, the effectiveness of enforcement and any possible impact of the issue on safety. We found no desire to remove the ability to conduct non-commercial cost sharing flights in recreational GA sector. In our view this is again an area where the principle of awareness of the obviously higher risk of recreational rather than commercial aviation has to be the key for those entering into such arrangements on a genuine cost sharing basis. We found that evidence on the the abuse of cost-sharing arrangements for what are actually blatant and thus illegal commercial activities is by definition difficult to substantiate. The CAA has carried out enforcement activities in this area, we believe it is inevitably impossible to detect all abuse nor to provide a reliable estimate of its incidence. Our view is that cost-sharing is an integral part of recreational aviation, generally permitted in other countries we have looked at and that the fact of its existence helps more people to enjoy private aviation than would otherwise be the case as well as increasing pilot hours which should help safety although this cannot be measured. It is right that enforcement action should be taken where breaches of the rules come to light which may of course also result in criminal prosecutions.[52]

12. Safety will never be "a job done". This is as true for recreational aviation as for any other area of life. There will always be a need for reinforcement and revision of safety messages which needs to be undertaken not least by the sector itself both through associations but also through an openness to peer comment and informal appraisal by individual pilots so that it is a consideration always in the mind of those engaged in flying and those supporting them .[53]

[42]Overall conclusion fed by majority of the paper and Annexes – most important sections are: The approach to risk and safety para 2.0, Assessment and Management of Risk para 3.0, Control of Risk and Risk. Hierarchy para 3.3 and the statistics provided throughout the paper.
[43]The level of safety achieved for Conclusion (1) is because of the efforts of individuals and organisations it is vital these efforts continue, and new initiatives and technology are embraced as needed – most important sections are: Risk – Pilots para 3.6, Safety Record para 3.7 and Safety Initiatives and Safety Action para 3.11.
[44]Control of Risk and Risk Hierarchy – Pilots para 3.6.
[45]Overall conclusion from work with Stakeholders and (in many cases) the individual nature of the activity.
[46]Safety Record para 3.7including table – Total Fatalities – GA Accidents (2008 – 2019) and Annex F - Fatal Accident Comparison by State – 2008-19.
[47]Over all safety conclusion most important sections are: Recreational General Aviation – the approach to risk and safety para 2.0, Control of Risk and Risk Hierarchy – Third Parties para 3.4 and Non-Pilot Participants para 3.5 and Annex D – General Aviation Accidents with Uninvolved 3rd Party Fatalities 1978 to July 2019.
[48]Passenger – Non-Pilot Participants para 3.5.
[49]Recreational General Aviation – the approach to risk and safety para 2.0, Third Parties para 3.4, and Annex C – The Regulatory Framework - Flying Display, event and activities Page C-7.
50 he effect of Red Tape Challenge / Regulatory change for GA para 3.8.
[51]Delegation and Deregulation para 4.0.
[52]Non-Pilot Participants para 3.5, Enforcement para 5.3, Annex G – Cost Shared Flights.
[53]Overall conclusion – main section Safety Initiatives and Safety Action para 3.11.

GA Safety Review Engagement Activity

DATE	ORGANISATION
23 July	GA Partnership (and others)
30 July	GASCo - General Aviation Safety Council
16 August	PPL IR Europe
16 August	BGA - British Gliding Association
21 August	AOPA - Aircraft Owners and Pilots Association
22 August	BMAA - British Microlight Aircraft Association
22 August	LAA - Light Aircraft Association
27 August	GAA / GBASF Chair - General Aviation Alliance
28 August	EASA GA Task Force Member (EAS)
25 September	GAAC - General Aviation Awareness Council
27 September	UKAB - United Kingdom Airprox Board
2 October	EASA - European Aviation Safety Agency
22 October	AAIB - Air Accidents Investigation Branch
24 October	GBASF - General and Business Aviation Strategic Forum
5 November	GA Partnership
5 November	AOG - Airfield Operators Group
20 November	Aviation Minister's GA Advocate / BAAC - British Balloon and airship club
3 Decmber	UKFSC - UK Flight Safety Committee
4 Decmber	CHIRP - Aviation and Maritime Confidential Incident Reporting
Various	John Thorpe FRAeS - Previous CE of GASCo with over 40 years of experience and safety data on GA.
Various	Dr David Smith BSc, PhD, CEng, FIFE, FIQA, HonFSaRs, MIGasE– www.technis.org.uk – safety analysis and comparisons on GA Safety

Review into the UK Approach to General Aviation safety Terms of Reference.

1.0 Background

1.1. In December 2018, the Department for Transport (DfT) published the 'Aviation 2050: The Future of Aviation" Green Paper which set out a number of policy options to improve aviation safety for public consultation.

1.2. The Green Paper proposed to "review the UK approach to General Aviation safety to re-evaluate the risk picture and risk appetite".[54] It stated the review would:

> "assess the current level of risk to all parties (pilots, passengers and third parties)

> map out the current regulatory system

> assess the theoretical coherence of the current regulatory system and how it operates in practice

> compare this with other international regulatory systems for General Aviation and regulatory systems in other sectors with similar safety risks and other sport and recreational activity

> make recommendations that ensure the regulatory system is fit for purpose and proportionate."[55]

2.0. GA Review: Governance, scope and timing

2.1. This review be led by an independent chair appointed by the DfT. the chair will have a respected background and expertise in both safety and risk management but will not have an aviation background. This chair will be supported by an expert secretariat and the DfT has directed the CAA to provide that support as they have the expert knowledge and well-established engagement with the GA community. The review should consider collaborating with academics conducting research into this area, such as Imperial College's Transport Risk Management Centre. Such research will be procured by the DfT.

2.2. General Aviation is defined by the International Civil Aviation Organisation as "All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire". This includes Aeroplanes, Airships, Balloons, Gliders, Gyroplanes, Helicopters and Microlights used for private flying consisting of personal transport, recreational and sporting activity.

2.3. The review is intended to focus on the non-commercial operations subset of the above definition focusing predominately on sport, recreational and personal transport aviation. The Chair will have the authority to vary slightly from this scope where it is beneficial for the overall output and intent of the review to do so. The review will take account of the work on the 'Review of UK Civil Flying Display and Special Event Governance for the Department for Transport' (published on 14 November 2018) and avoid any duplication of issues already addressed.

2.4. The 'Aviation 2050: The Future of UK Aviation' Green Paper consultation period closed on 20 June 2019. The final strategy will be published in late 2019. It was decided the review into General Aviation should not begin before the end of the Green Paper consultation period to allow consideration of stakeholder opinions into the review.

2.5. Now the Green Paper consultation period has ended the General Aviation review can begin and would ideally be published for consultation with the public and the aviation community alongside the publication of 'Aviation 2050: The Future of UK Aviation' strategy.

2.6. The target for completion of the review is spring 2020.

2.7. There will be monthly progress meetings with the DfT. These meetings are to ensure the DfT is kept fully informed of the progress against the project plan and into enable the Independent Chair to inform the DfT of their areas of focus over the coming period and raise any issues of concern.

3.0. GA Review: Content and issues for consideration

3.1. The review aims to re-evaluate the risk picture and risk appetite for UK General Aviation. We should therefore consider whether we want to define an acceptable level of risk for General Aviation, as we have done for Commercial Aviation.

3.2. In private flying, both the pilot and the participant/passenger have more control over whether they fly and their associated risk. Recreational safety is therefore different to commercial safety. However, as third parties do not have such control this principle does not apply to them. The review should therefore consider how third parties are protected. EASA have published differing risk levels in aviation for pilots, passengers down to attendees at airshows – EASA's methodology for third party risk calculation should be examined.

3.3. The review should examine current instances of delegation and assess the impact delegation of activity has had on GA Safety. The review should also examine if there is any evidence that the CAA's response to the red tape challenge and the work of the EASA GA Roadmap has had an impact on overall safety rates. The review should also explore the possibility of expanding delegation to other areas if the work indicates it is safe to do so.

3.4. The review should examine best practice in other areas of risk management and safety, such as the best practice and regulation of higher risk sporting activity.

3.5. Illegal public transport, where remuneration significantly beyond that permitted by the cost sharing rules for non-commercial operations is received, remains a concern. It is important that members of the public are appropriately protected for the activities they are engaging in. The review should identify the available evidence to establish the significance of this issue and the enforcement action being taken. Additionally, the review should consider the cost sharing derogation and its relationship with safety for non-commercial general aviation operations.

3.6. Development in aviation safety have resulted in a very high level of safety in Commercial Air Transport (CAT). Applying the same standard to private or non-commercial flying would, in effect, eliminate private flying as it would be impossible to achieve the levels of safety achieved by CAT in the modern age. If the level of safety achieved in commercial aviation is not appropriate for non-commercial operations, then the review needs to propose what level is acceptable and why.

3.7. Recognising that there is a different level of safety in non-commercial aviation the review will need to consider how that difference can be effectively and meaningfully communicated to members of the public taking part in general aviation.

4.0. GA Review: Other Areas of Consideration

4.1. For this review to have impact its conclusions and recommendations must be respected by the General Aviation community. An effective communications strategy which seeks to ask rather than impose will be important in engendering trust from the GA community.

4.2. Stakeholder mapping will be conducted as part of the review and this will be used to ensure a wide range of stakeholders and impacted parties are included in the review.

[54]Para 6.15 and 7.31
[55]Para 6.16

Biographical note for GA Recreational Safety Review

Geoffrey Podger

Geoffrey Podger CB is Senior Visiting Research Fellow at the Centre for Risk Management at King's College, London. He is currently Head of the UK Delegation to the Intergovernmental Commission on the Channel Tunnel and Chair of National Compliance and Risk Qualifications as well as holding other non-executive and advisory roles in the public, private and voluntary sectors. He previously led four UK and overseas regulatory related agencies including as Chief Executive of the Health and Safety Executive from 2005 to 2013. Geoffrey chaired the Civil Aviation Authority Challenge Panel on Air Display Safety in 2015/6.

Tony Rapson

Tony joined the CAA in 2008, as an airspace policy expert, following a 27-year career in the Royal Air Force including tours in the Ministry of Defence, Air Command Headquarters and as the Office Commanding the London Air Traffic Control Centre (Military). He worked on the Future Airspace Strategy, before moving to the Department for Transport as a secondee, as the UK policy lead for the implementation of the Single European Sky. In January 2014 he moved to set up and lead the CAA's General Aviation Unit to deliver a more proportionate, effective, regulatory regime that supports and encourages a dynamic general aviation sector. He stepped down as Head of the GA Unit in May 2019 and has been working on this safety study since then.

The Regulatory Framework

The aviation regulatory system in the UK has three interlinked but separate sources, the Internavtional Civil Aviation Organisation (ICAO) system, the European Aviation Safety Agency (EASA) system and the UK National system. This framework is set out in the diagram below:

(*for airworthiness only)

1.0. International Civil Aviation Organisation – ICAO

1.1. ICAO is a UN specialized agency, established by States in 1944 to manage the administration and governance of the Convention of International Civil Aviation (Chicago Convention). ICAO works with the Conventions 193 Member States and industry groups to reach consensus on the international civil aviation Standards and Recommended Practices (SARPs) and polices in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector. These SARPs and policies are used by ICAO Member States to ensure that their local civil aviation operations and regulations confirm to global norms, which in turn permits more than 100,000 daily flights in aviation's global network to operate safely and reliably in every region of the world[56]

1.2. ICAO is focused on international air travel which in turns means the vast majority of its work and setting SARPs is aimed at Commercial Air Transport and less on sport, recreational and personal transport. The overall success of the international aviation system to drive continuous improvement in safety has meant that over time the gap has winded between what has been achieved in commercial aviation activity and what is possible in the non-commercial (sport, recreation and personal transport) sector. ICAO will inevitably be focused on commercial operations, complex aircraft and complex organisation. The challenge to individual states is to follow and achieve those improvements in commercial aviation whilst not imposing them on General Aviation where the requirements cannot be met within an economically viable system

2.0. European Aviation Safety Agency – EASA

2.1. The European Aviation Safety Agency was set up in 2002 as an Agency of the European Union it has 32 Members, the 28 EU states plus Switzerland, Norway, Iceland and Liechtenstein. (As of 31 January 2020 this will reduce to 27 when the UK leaves the EU).

The Mission of EASA is:

> Ensure the highest common level of safety protection for EU citizens

> Ensure the highest common level of environmental protection

> Single regulatory and certification process among Member States

> Facilitate the internal aviation single market and crate a level playing field

> Work with other international aviation organisation and regulators

2.2. The Mission is then evolved into key tasks:

> Draft implementing rules in all fields pertinent to the EASA mission

> Certify and approve products and organisations, in fields where EASA has exclusive competence (e.g. airworthiness)

> Provide oversight and support to Member States in fields where EASA has shared competence (e.g. Air Operations, Air Traffic Management)

> Promote the use of European and worldwide standards

> Cooperate with international actors to achieve the highest safety level of EU citizens globally (e.g. EU safety list, Third Country Operators authorisations)[57]

[56]ICAO Website "About ICAO": https://www.icao.int/about-icao/Pages/default.aspx
[57]EASA Website "The Agency": https://www.easa.europa.eu/the-agency/the-agency

2.3. The foundation of the EASA rulemaking is the Basic Regulation, "on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency…" the first iteration of which was Regulation (EC) No 1592/2002. The latest version is Regulation (EU) 2018/1139.[58] It is only with this latest version that EASA and the Member States have made considerable efforts to ensure that the regulations can be made proportionate and fit for purpose for both Commercial and Non-Commercial (General Aviation) operation.

2.4. All aircraft operated with in the EASA Member States come under the EASA rules unless specifically excluded. There are several exclusions, including for military, customs, police, search and rescue, firefighting, border control, coastguard or similar activities.[59] Additionally Annex 1 to the Basic Regulation lists those aircraft whose design, production, maintenance and operation are excluded from the Basic Regulation requirements and therefore fall to the Metmber State to regulate, this includes the personnel and organisations involved in these activities.[60] Broadly speaking these are older and/or historic aircraft, amateur / homebuilt aircraft and Microlight aircraft. A copy of the relevant sections of Annex 1 to the Basic Regulation is at Appendix A1. It follows that, that if required, that these aircraft are regulated by the National Aviation Authority in the case of the UK the Civil Aviation Authority.

2.5. The detailed Implementing Regulations, Guidance Material and Alternate Means of Compliance that sit below the Basic Regulation are extensive and the regulatory structure for EASA can be accessed via the link in the footnote.[61]

2.6. More detail and the links to all the regulations are available on the EASA Website.[62] Not all regulations will be applicable to GA and which ones are will be dependent on the exact activity being carried out and it is not always easy for the operator/pilot to be certain which rules should be used. In the early days of EASA the focus was very much on Commercial Air Transport and this resulted in some of the rule sets being disproportionate for General Aviation and their non-commercial operations. Following challenge from stakeholders EASA recognised that work was needed to ensure that the rule set was fit for purpose and proportionate for General Aviation. At the Annual EASA Safety Conference in Rome in 2015 EASA set out is vision and commitment to GA to deliver better and lighter regulation for General Aviation, "…something that was urgently needed after the initial regulations imposed too much 'red tape' on the GA Community."[63]

2.7. EASA set out six GA strategic principles and 6 GA key objectives :

EASA GA Strategic Principles

> One size does not fit all

> Use rules when it is the only or best way to reach the safety objectives

> Adopt a risk-based approach

> Protect 'what shows to work well' unless there are demonstrable and statistically significant safety reasons against doing so

> Apply EU smart regulation principles; and

> Make the best use of available resource and expertise

EASA GA Key Objectives

> Facilitate access to IFR Flying

> Allow the training of private pilots outside Approved Training Organisations (DTO concept)

> Simplify and reduce the costs related to the maintenance of your aircraft (Part-M, Part CAO, Part-M Light)

> Allow and promote the introduction of new technology (or the Standard Changes and Repairs Process)

> Simpler certification process

> Develop the use of Industry Standards (or CS-23 reorganisation)

2.8. EASA has recently updated its strategic priorities[65] for General Aviation it the GA Roadmap 2.0, these priorities are:

> A continued priority for General Aviation

> Promote GA Safety Culture

> Net Safety Benefit

> Embracing new business models

> Adapt design and production rules

> GA goes digital

2.9. The work at EASA to relieve GA of unnecessary regulatory burden, taking a proportionate and risk-based approach to rules postdates the work in the UK on the Governments GA Red Tape Challenge and the UK played a key role in supporting EASA in this work and providing the lessons learnt from the UK experience with the Red Tape Challenge. Although the UK's future relationship with EASA is unclear we will continue to influence their work in whatever way is appropriate. More information on the EASA GA regulatory framework and the work of EASA can be found on the GA pages of the EASA Website.[66]

2.10. During our visit to EASA they reiterated their commitment to this work and confirmed there is still much to be done. They did have concerns that some member states would 'gold plate' the EASA regulation thereby reducing its proportionality. They also confirmed progress on the Basic Instrument Rating and Part M Light the former making access to Instrument Flying more accessible and the latter making maintenance more proportionate and flexible for non-commercial operations. In this work EASA has moved away from detailed numerical targets and instead are looking at trends. eg for the Basic Instrument Rating they will measure success by the increase in the number of GA filed IFR flight plans.

2.11. EASA have also launched a GA Safety Award[67] contest to award the most safety-beneficial smartphone / tablet application for the use of GA Pilots. The GA Safety Award aims to promote the development of reliable tools to improve safety, encourage investment, support and enhance visibility of valuable products, further enhance GA community engagement with safety.

[58]All versions of the Basic Regulation can be found on the EASA Website: https://www.easa.europa.eu/regulation-groups/basic-regulation
[59]Basic Regulation (EU) 2018/1139 Article 2 para 3(a)
[60]Basic Regulation (EU) 2018/1139 Article 2 para 3(d)
[61]EASA Regulations Structure: https://www.easa.europa.eu/download/regulations-structure/regulations_structure.pdf
[62] EASA Regulations: https://www.easa.europa.eu/regulations
[63]EASA GA Roadmap: Update 2018 Moving Towards Implementation: https://www.easa.europa.eu/sites/default/files/dfu/EASA_GA_ROADMAP_2018_EN_final.pdf
[64]ibids
[65]EASA Website Strategic Priorities for General Aviation: https://www.easa.europa.eu/easa-and-you/general-aviation/general-aviation-road-map
[66]EASA Website General Aviation home page: https://www.easa.europa.eu/easa-and-you/general-aviation
[67]EASA GA Safety Award – Rules of Contest: https://www.easa.europa.eu/sites/default/files/dfu/EASA%20GA%20Safety%20Award%20-%20Rules%20of%20Contest.pdf

3.0. National Regulation – Civil Aviation Authority (CAA)

3.1. "The CAA is the UK's specialist aviation regulator and works so that:

> The aviation industry meets the highest safety standards,

> Consumers have choice, value for money, are protected and treated fairly when they fly,

> Through the efficient use of airspace, the environmental impact of aviation on local communities is effectively managed and CO2 emissions are reduced,

> The aviation industry manages security risks effectively"[68]

3.2. The CAA is a public corporation, established by Parliament in 1972 as an independent specialist aviation regulator. It is a legal requirement that the CAA costs are met from charges to those it provides a service to or regulates. Whilst not unique this is important as many other National Aviation Authorities are, at least in part, funded by Government/Public funds which gives them a great scope for initiatives in relation to this Sector of aviation. That said the UK Government has provided funding for some initiatives for general aviation and we believe the door should be kept open for future such initiatives.

3.3. The UK has a role to play in managing the regulation of EASA aircraft and operations but all those activities falling outside the EASA Basic Regulation are regulated directly by the CAA. The CAA has to set out the necessary rules and guidance for the operations of these aircraft, this it does through the appropriate Civil Air Publications (CAP). Broadly speaking these cover:

> Safety guidance and resources

> Learning to fly

> Pilot Licences, ratings and medical certificates / declarations

> Aircraft ownership and Maintenance (Airworthiness)

> Flying displays, events and activities

3.4. Any aviation regulatory system will have to consider how these areas are covered and then issue appropriate regulation and guidance. For the UK more, detail with appropriate links can be found on the General Aviation pages of the CAA Website.[69] Safety guidance and resources is covered within the Safety section of this paper, taking the other items in turn:

3.5. Learning to Fly

The Flying training industry in the UK falls into 3 main categories. Those organisations just providing training for Commercial Licences/rating, those providing training for both commercial and private license/rating and those providing training for just private licences and training. For private licences the UK has also retained a National Licence in additional to the EASA Licences. The UK CAA has endeavoured to provide a proportionate regulatory regime to encourage flying training:

> Flying Training has been permitted from unlicensed aerodromes since April 2010.

> CAA supported Registered Training Facilities with minimal regulation and led the work at EASA to ensure that Declared Training Facilities were a better and more proportionate solution than the previous requirement for all training organisations to become certificated Approved Training Organisations.

> The CAA has supported work at EASA to allow flying hours in Permit to Fly aircraft to be counted towards EASA Licences.

> The CAA continues to consult on the possibility and safety case for allowing paid for ab initio training in Permit to Fly aircraft.

> In September 2014 the CAA published CAP 1216 The PPL Review – A review of private and recreational flight training in the UK. Available information, costs, regulatory requirements and associated hurdles.[70] The study is still used to guide the work of the CAA and engagement with the GA Sector via the GA Partnership and General and Business Aviation Strategic Forum. Although the work did set out further work it broadly concluded that "…the process of learning to fly was not found to be overly burdened by unnecessary bureaucracy or disproportionate regulation that is directly imposed by the CAA or EASA…" In terms of costs the review considered that "…while CAA fees are a frequent complaint, in the context of private flight training itself, the direct charges on a prospective licence holder are not excessive. The main components of an hour's flight training continue to be fuel, maintenance and the fixed costs associated with running a training establishment."

> One of the issues regularly raised about the cost of flight training is the charging of VAT for training. This is not a regulatory issue, but we assume it will be an area that the newly reformed All Party Parliamentary Group for General Aviation will, amongst other things, pursue.[71]

3.6. Pilot Licences ratings and medical certificates / declaration – Some of this overlaps with flying training above but in addition to the items above the CAA has also led the way in permitting the use of Medical declarations to the DVLA normal driving licence standard. Allowing pilots who are fit to drive to be fit to fly with the minimum of regulatory intervention and minimal cost. Rather than needing an assessment from a GP or even an Aero Medical Examiner (AME) and the issue of a medical certificate. The Medical requirements for all types of Private Licences are set out on the CAA Website.[72] Medical declarations can also be made via the CAA Website.[73]The EASA Member States, so far, have not supported the move to Medical declarations and the LAPL Medical is the lowest medical requirement within the EASA system. The requirements are not disproportionate but often GPs can ask for investigations to prove candidates meet the requirements which can lead to substantial cost and delay in demonstrating the required standard is met. More information on the LAPL Medical certificate is available on the CAA Website.[74] The CAA will continue to look for and take any opportunity to allow medical declarations within the EASA system. It has to be noted that during our visit to EASA they confirmed there was still no appetite amongst the Member States to move towards medical declarations. One of the many comparators used between the UK and the USA is the more accessible and greater uptake of instrument ratings (IR) in the USA. The CAA and GA Organisations have been working with EASA to develop the Basic Instrument Rating (BIR) to improve access and update of instrument flying in Europe. It has yet to be seen if this will act a de facto replacement for the UK IMC / IR (R) rating[75] which only applies in UK airspace. More information is available on licences and other approvals from the CAA Website.[76]

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[68]CAA Website Our role: https://www.caa.co.uk/Our-work/About-us/Our-role/
[69]CAA Website General Aviation: https://www.caa.co.uk/General-aviation/
[70]CAA Website Publication Search CAP1216: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=6416
[71]General Aviation APPG Website Tax and Regulations: http://www.generalaviationappg.uk/tax-and-regulations/
[72]CAA Website Medical requirements for private pilots: https://www.caa.co.uk/General-Aviation/Pilot-licences/Medical-requirements/Medical-requirements-for-private-pilots/
[73]CAA Website Pilot Medical Declaration: https://apply.caa.co.uk/CAAPortal/terms-and-conditions.htm?formCode=PMD
[74]CAA Website LAPL Medical Certificate: http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6851
[75]IMC – Instrument Meteorological Conditions Rating / Instrument Rating (Restricted)
[76]CAA Website Licences and other approvals: http://www.caa.co.uk/licences/

3.7. Aircraft ownership and maintenance (Airworthiness) – Aircraft ownership brings with it the responsibility to maintain the aircraft appropriately. There is undoubtedly a significant additional cost for certified aircraft that are compliant with the ICAO system when compared to nationally regulated aircraft – often referred to as sub ICAO. The level of assurance for all aviation activity under the ICAO system is very high but it does come at a cost. As far as we could establish this cost of compliance differential exists in every ICAO state. Exactly what is required depends on the intended use of the aircraft, so it is important to understand this before purchasing an aircraft to make sure the aircraft purchased and the required maintenance (and its cost) are fully understood. Most, if not all of, the flying Associations' websites carry information on aircraft ownership and maintenance and links are below[77] for the Aircraft Owners and Pilot Association, the Light Aircraft Association and the British Microlight Aircraft Association as just three examples. In many cases their information is linked back to the CAA and/or EASA regulations, but the content is much more focused to fit their own target audience. In the UK there are 5 main categories of aircraft:

> Certificated aircraft under ICAO and EASA rules (ICAO Compliant)

> Permit to Fly aircraft regulated by the UK CAA (not compliant with ICAO)

> Aircraft not regulated for airworthiness purposes (not compliant with ICAO)

> Aircraft being developed or modified under the UK CAA's E Conditions (not compliant with ICAO)

> Non-European registered aircraft (predominately but not exclusively USA Registered / N Reg aircraft) (ICAO Compliant)

More detail on each of these aircraft regulatory types is set out in Appendix C2.

3.8. Flying displays, event and activities - the regulatory requirements for Flying display and special events are set out in CAP 403 – Flying Display and Special Events: Safety and Administrative Requirements and Guidance[78] and CAP 1724 – Flying Display Standards Document.[79] There has been significant focus on these regulation in the 4 years since the tragic Shoreham accident where 11 men lost their lives. The recommendations made by both the Air Accident Investigation Branch (AAIB) and the CAA's Air Display Review have now all been implemented. One of the AAIB recommendations was for the Department of Transport to commission and report the findings of, "…an independent review of the governance of flying display activity in the United Kingdom, to determine the form of governance that will achieve the level of safety it requires".[80] This Review's Terms of Reference state "The review will take account of work on the 'Review of UK Civil Flying Display and Special Event Governance for the Department for Transport'[81] published on 14th November 2018 and avoid any duplications of issues already addressed." That report, amongst other things, concludes "that a transition towards greater self-governance by the display industry is not an appropriate course of action to take". Accordingly, this review does not consider the further delegation of air displays or the vast majority of ex-military aircraft regulated under the CAA in accordance with CAP 632 – Operation of 'Permit to Fly' ex-military aircraft on the UK register[82] and CAP 1640 – Ex-Military Aircraft: Design, restoration and continuing airworthiness approval.[83]

[77]AOPA: https://www.aopa.co.uk/go-flying/aircraft-ownership.html LAA: http://www.lightaircraftassociation.co.uk/ BMAA: https://www.bmaa.org/
[78]CAP 403: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=32
[79]CAP 1724: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=9005
[80]Aircraft Accident Report 1/2017 Safety Recommendation 2017-011: https://www.gov.uk/aaib-reports/aircraft-accident-report-aar-1-2017-g-bxfi-22-august-2015
[81]Review of UK Civil flying display and special event governance: https://www.gov.uk/government/publications/review-of-uk-civil-flying-display-and-special-event-governance
[82]CAP 632: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=135
[83]CAP 1640: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=8322

Annex 1 to EASA Basic Regulation – Aircraft not falling under the Regulation

Annex 1 to the Basic Regulation states the following:

1. Categories of manned aircraft to which this Regulation does not apply:

   a. Histroic aircraft meeting the following critera:

   i. Aircraft whose:
   - Initial design was established before 1 January 1955, and
   - Production has been stopped before 1 January 1975;

   or

   ii. Aircraft having a clear historical relevance, related to:
   - a participation in a noteworthy historical event,
   - a major step in the development of aviation, or
   - a major role played into the armed forces of a Member State;

   or

   b. aircraft specifically designed or modified for research, experimental or scientific purposes, and likely to be produced in very limited numbers

   c. aircraft including those supplied in kit form, where at least 51% of the fabrication and assembly tasks are performed by an amateur, or a non-profit making association of amateurs, for their own purposes and without any commercial objective;

   d. aircraft that have been in the service of military forces, unless the aircraft is of a type for which a design standard has been adopted by the Agency;

   e. aeroplanes having measurable stall speed or the minimum steady flight speed in landing configuration not exceeding 35 knots[84] calibrated air speed (CAS), helicopters, powered parachutes, sailplanes and powered sailplanes, having no more than two seats and a maximum take-off mass (MTOM), as recorded by the Member States, of no more than:

	Aeroplane/ Helicopter/ Powered parachute/ powered sailplanes	sailplanes	Amphibian or floatplane/ helicopter	Airframe mounted total recovery parachute
Single-seater	300 kg MTOM	250 kg MTOM	Additional 30 Kg MTOM	Additional 15 kg MTOM
Two-seater	450 kg MTOM	400 kg MTOM	Additional 45 kg MTOM	Additional 25 kg MTOM

   When an amphibian or floatplane/helicopter is operating both as a floatplane/helicopter and as a land plane/helicopter, it must fall below the applicable MTOM limit

   f. single and two-seater gyroplanes with a MTOM not exceeding 600 kg;

   g. replicas of aircraft meeting the criteria of points (a) or (d), for which the structural design is similar to the original aircraft.

   h. Balloon and airships having a single or double occupancy and a maximum design volume of, in the cast of hot air not more than 1,200 m3, and in the case of other lifting gas not more than 400 m3;

   i. Any other manned aircraft which has a maximum empty mass, including fuel, of no more than 70 kg.

2. Furthermore, this Regulation shall not apply to:

   a. Tethered aircraft with no propulsion system, where the maximum length of the tether is 50 m, and where:

   i. The MTOM of the aircraft, including its payload, is less than 25kg, or

   ii. In the case of a lighter-than-air aircraft, the maximum design volume of the aircraft is less than 40m3;

   b. Tethered aircraft with a MTOM of no more than 1 kg.

[84]Basic Regulation (EU) 2018/1139 Article 2 para 8 also gives Member States the option to opt out of the Basic Regulation for aircraft not exceeding 45 knots CAS and up to 600kg. As of 1 July 2019 the UK was still considering whether or not to take this option.

Aircraft Ownership and Maintenance

Five types of aircraft for regulatory purposes

1.0. Certificated aircraft under ICAO and EASA rules

1.1. These are aircraft that have been certified to international standards with an appropriate Certificate of Airworthiness (CofA) and have to be maintained accordingly. There will be a Type Certificate Holder who is responsible for the aircraft type and for providing on-going maintenance and airworthiness information. There are significant costs to ensure an aircraft meets the required standard and certificates are issued and kept up to date. CofA's can be renewed by CAA approved organisations and details of requirements can be found on the CAA Website.[85] CofA remains the highest level of Airworthiness assurance. Since 2003, EASA has been responsible for the certification of aircraft in the European Union. The Certificate testifies that the type of aircraft meets the safety requirements set by the European Union.[86] The certification process is comprehensive and comes at considerable cost which has resulted in very few new certificated GA aircraft and those that have represent a step change in cost to purchase.

2.0. Permit to Fly

2.1. A Permit to Fly may be issued to aircraft that do not meet the International Civil Aviation Organisation (ICAO) certification standards required for the issue of a Certificate of Airworthiness (C of A) subject to satisfying certain requirements. A Permit to Fly will not be issued to an aircraft that is eligible for the issue of a Certificate of Airworthiness but may be issued in the event of a Certificate of Airworthiness becoming temporarily invalid. A UK national permit to fly is granted, in accordance with British Civil Airworthiness Requirements (BCAR) A3-7 (CAP 553 page 77 onwards)[87]. Aircraft in this category are generally ex-military, amateur built, microlight, gyroplanes or other aircraft that for one reason or another do not have a valid Type Certificate. CAP 733 Permit to Fly Aircraft[88] is a comprehensive source of information regarding Permits to Fly and provides guidance on the following topics:

> Qualifying for the initial issue of a Permit to Fly

> Criteria for the issue of a Permit to Fly

> Modifying or repairing a Permit to Fly aircraft

> Maintenance inspection and revalidation of an aircraft issued with a Permit to Fly

> Operation of a Permit to Fly aircraft

2.2. In the UK much of the maintenance oversight associated with Permit to Fly aircraft has been delegated to associations such as the Light Aircraft Association and the British Microlight Aircraft Association. The means and approval by which Associations can take on more delegated activity from the CAA is set out in BCARs at Chapter A8-26 Approval of Organisations Supporting Recreational Aviation. Currently the following organisations hold A8-26 Approvals:

> Light Aircraft Association

> British Microlight Aircraft Association

3.0. Aircraft not regulated for airworthiness purposes

3.1. Although it is mandatory to comply with the Rules of the Air, hang gliders, foot launched power gliders, paragliders and registered single seat microlights below 300kg are not regulated for airworthiness purposes and therefore the aircraft do not need to hold a CofA or Permit to Fly.

4.0. Aircraft being developed or modified under the UK CAA's E Conditions

4.1. In November 2015 following key changes to the Air Navigation Order the CAA published CAP 1220 Operation of experimental aircraft under E Conditions.[89] These requirements for experimental aircraft benefit small-scale aircraft designers and manufacturers by reducing the red tape and financial burdens associated with securing airworthiness and operational approval for new light aircraft designs. The requirements allow aircraft designers to try out a new concept aircraft (up to a maximum take-off mass of 2,000 kg) in the air without going through the costly and time-consuming procedures that currently exist to get a new design past the initial stage of proof-of-concept prototype. E Conditions can also be used to test aircraft modifications or if the aircraft is being operated in a manner or role that is previously unproven. If, after trying out a promising idea, it is thought to be viable, then a full certification programme can be planned and funded in the usual way. Individuals and organisations conducting proof-of-concept flights will still be required to undertake a risk assessment to support the activity and ensure that the risks to third parties are adequately addressed. For example, flights would not be allowed over congested areas, the pilot must be suitably qualified, and no passengers or cargo can be carried. Prior to the commencement of flight, an E Conditions Declaration must be submitted to the CAA relating to the flight test programme.

5.0. Non-European registered aircraft (predominately but not exclusively USA Registered / N Reg aircraft)

5.1. The International Civil Aviation Organisation (ICAO) set up under the Chicago Convention allows certain rights for aircraft meeting the requirements – ICAO compliant Certificates of Airworthiness, Licences and Medicals – certain rights of passage and use within states that are signatories to the Chicago Convention. It is these rights that permits the operation and ownership of non-UK registered aircraft in the United Kingdom and the operations of UK registered aircraft in other states. In the UK and indeed throughout Europe the vast majority of non-European registered aircraft come from the USA and it is these aircraft that we focus on this review.

5.2. The US Federal Aviation Administration (FAA) listed 729 American Registered aircraft – N-Reg – as resident in the UK on 17 July 2019.[90] This includes business aviation and private non-commercial operators. The Business aviation owners will be regulated in accordance with the Commercial Air Transport rules. These 729 aircraft compare to 19,810 aircraft of all types and classes on the UK Aircraft Register on 1 January 2019.[91] This 19,810 is split 10,470 EASA aircraft and 9,340 non-EASA aircraft (Basic Regulation Annex 1 aircraft).

[85]CAA Website Certificates of Airworthiness: https://www.caa.co.uk/Commercial-Industry/Aircraft/Airworthiness/Certificates-and-permits/Certificates-of-airworthiness/Certificates-of-Airworthiness/

[86]EASA Website Aircraft Certification: https://www.caa.co.uk/Commercial-Industry/Aircraft/Airworthiness/Certificates-and-permits/Certificates-of-airworthiness/Certificates-of-Airworthiness/

[87]CAP 553 British Civil Airworthiness Requirements: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=220

[88]CAP 733 Permit to Fly Aircraft: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=1330

[89]CAP 1220 Operation of experimental aircraft under E Conditions: http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=6825

[90]FAA Website FAA Registry Aircraft Inquiry – Territory and Country – United Kingdom: https://registry.faa.gov/aircraftinquiry/Country_Results.aspx?Countrytxt=UNITED+KINGDOM++++&PageNo=1

[91]CAA Website UK Registered Aircraft as at 1 January 2019 by Aircraft Class and EASA Category: https://www.caa.co.uk/uploadedFiles/CAA/Content/Standard_Content/Data_and_analysis/Datasets/Aircraft_register/EASA/2019%20EASA%20category%20and%20aircraft%20class.pdf

5.3. UK and European accidents statistics show that overall non-UK/European registered aircraft do not have a higher accident rate. A 2015 EASA study showed that N-Reg aircraft had 3% of the GA accidents (2010 – 2014) but made up approximately 8 to 10% of the European GA Fleet. There is no indication that the overall proportions have changed since then.

5.4. The UK CAA conducts Aircraft Continuing Airworthiness Monitoring (ACAM) surveys each year and N Reg and other non-UK registered aircraft are included in those samples. There is no evidence that overall non-UK registered aircraft are maintained to a lower standard than UK registered aircraft.

5.5. Both the US and UK/European regulatory regimes are similar in that they have different rules depending on whether the aircraft is going to operate on a commercial on non-commercial basis. The US system is seen as more proportionate whilst delivering a similar or better overall safety outcome. (There are other factors that contribute to a better accident rate in the US – less complex airspace and better weather in many states where non-commercial flying is most popular.) It follows that an N Reg aircraft operated and maintained on a non-commercial basis does not meet the requirements to be used for commercial operations.

5.6. The UK's work on delivering regulatory change to provide a more proportionate regulatory regime and the European work on the GA Roadmap to deliver 'simpler, lighter, better' regulation is in part a recognition that a less burdensome regulatory regime can deliver the correct safety outcomes and that more regulation does not mean better safety. One aim of this work is to reduce the number of N-Reg aircraft operating in the UK/Europe, but it is still too early to say if this is being achieved.

5.7. There are two main aviation reasons why private pilots elect to use the N Reg.
The first is to be able to use the FAA Instrument Rating and to obtain worldwide privileges of a rating it is general necessary for the country that issued the rating to be the same as the country in which the aircraft is registered. The FAA Instrument Rating is based on competency-based training and examination rather than prescriptive syllabi with a lot more responsibility invested in the FAA Examiner. EASA (and therefore the UK) has tried to address this issue by the development of the Basic Instrument Rating to provide greater and easier access to Instrument Flight Rules (IFR) flying. This is still a work in progress. EASA has also introduced a change that requires Pilots resident in the EU to hold an EASA licence so that any holder of an FAA licence or rating has to also hold a European Licence.

5.8. The second is a more liberal approach to maintenance and maintenance requirements. Modifications can be more easily installed and in a few cases are the only way modifications can be installed if the aircraft manufacturer and type certificate holder is unwilling or unable to pay for European certification of the modification. Also, for non-commercial operators an element of pilot maintenance is allowed. EASA (supported by the UK) has been working to fully understand the technical detail of the American system and introduce similar liberalisation into the European systems. There has been good progress with the already introduced 'Part Maintenance' (Part M) into European regulation and the ongoing development of Part M Light for private non-commercial operations. There are several articles online concerning the pros and cons of owning and operating an American registered aircraft in the UK one of the more comprehensive is provided in the link below.[92] If the UK remains part of the EASA then it will be vital that the CAA and associations continue to engage with EASA to gain better alignment between the European and FAA systems where appropriate. In the event that the UK is no longer part of EASA then resource will be needed to establish how much the UK should depart from the European system and how closely it should align with the FAA system.

5.9. It is unlikely that the two systems will ever be completely aligned but even if they were there would remain some financial advantages to being on the N Reg such as no Insurance Premium Tax (saves 5% on the premium). US-registered aircraft must be owned by a US citizen, or a US corporation (with a minimum US shareholding requirement) or a US based Trust (which must own at least 75% of the aircraft). This is a legitimate device and a significant number of N-reg aircraft around the world are owned by such trusts. There are a number of trusts with UK offices that are reasonably priced, around a few hundred pounds a year, and some that go after the business aviation market and charge accordingly more. Although the CAA has no oversight of the Trusts they can often be an extra check in the system as a trust will often set out what an aircraft can be used for and even who can fly it. Any other use would be against the trust and potentially illegal. This does not mean that all non-UK registered aircraft are maintained as they should be, just as not all UK registered aircraft might not be. The CAA responds to intelligence reports, whistleblowing report and its own information to target any aircraft that is not being maintained or operated correctly regardless of its state of registry. Where necessary the CAA will (and does) issue legally binding grounding orders. Although all non-UK registered aircraft must be notified before entering the UK it is not possible to keep a track on exactly where they are at any time – nor is there any requirement to do so. One of the most detailed directories available on Foreign Registered Aircraft based in the British Isles is available from LAAS International[93] who use the extensive community of aircraft spotters to report the location of non-UK registered aircraft. The online version of this directory is available to LAAS Members,[94] alternatively a hard copy can be purchased as a companion book to their British Isle Civil Register.[95]

[92]Website "Peter's Website – Aviation Stuff (the really interesting bit): http://www.peter2000.co.uk/aviation/faa-nreg/index.html
[93]Website LAASDATA.COM – the aviation enthusiast's website: https://www.laasdata.com/
[94]Website LAASDATA.COM – the aviation enthusiast's website – LAAS Foreign Registered Aircraft based in the British Isles: https://www.laasdata.com/fra/
[95]Website LAASDATA.COM – the aviation enthusiast's website: https://www.laasdata.com/publications.php

General Aviation Aircraft Accidents with Uninvolved 3rd Party Fatalities 1978 to July 2019

Date	Location of Accident	Total Fatalities	Uninvolved 3rd Party Fatalities	Short Description	Accident report extract
28/09/1985	Fordingbridge (Hampshire)	1	1	A/c crashed after take-off hitting people attending a fete in an adjacent field. One person attending the fete was killed.	The a/c was departing from a field adjacent to a fete he had been attending. The pilot chose a take-off path towards the West and taxied until some 25 metres from the Eastern Boundary, made a ”U” turn & without stopping began a take-off run. The take-off & power checks had been performed during the taxying. The wind was reported as variable generally southerly less than 5 knots. The take-off distance available on this take off path was 335 meters to a 50ft high oak tree. The a/c initially climbed rapidly but then assumed a shallow decreasing climb angle which was not going to take it over the tree. It then sank rapidly & hit the ground 40 metres past the tree in the area of the fete. Eight spectators & the pilot were taken to hospital. Investigation of the a/c revealed no major pre-impact defects (AAIB Bulletin 5/86). The AAIB reported that the pilot of the accident aircraft had been asked to carry out a fly past of the fete but refused on safety and legal grounds. However, following a visual inspection of a neighbouring field asked permission to land there so he could attend the fete he and the pilots of two other microlight aircraft did so. The AAIB report can be seen here: https://assets.publishing.service.gov.uk/media/5422fb62ed915d1371000835/Gemini-Striker_microlight_G-MMXX_05-86.pdf
30/04/1987	Solent (Hampshire)	5	2	Probable loss of control. a/c struck yacht. 5 people killed, 3 on board the aircraft and 2 on the yacht.	Cloud on route reported as layered scattered up to 8,000 ft with locally embedded CU. a/c flown between 1000ft and 4500 ft to avoid cloud. Tanks were full prior to departure. In the Solent area a/c asked by Southampton ATC if it could descend and accept a re-routing which involved a height loss of 500ft and a heading change of 110 deg. Pilot accepted both. Shortly afterwards a/c dived out of low cloud and struck a yacht. Both then disintegrated and sank. Very little wreckage was recovered. All three occupants of the a/c were killed as were the two occupants of the yacht. Pilot had no instrument flying qualifications and a/c was registered for VMC flight only. Accident was probably the result of the pilot continuing VFR into adverse weather for which he was not trained or qualified. Weather conditions and a/c manoeuvres would have been conducive to spatial disorientation and consequent loss of control. The full AAIB Report can be seen here: https://assets.publishing.service.gov.uk/media/5422fc3eed915d13710008a3/4-1988_OO-JEL.pdf

General Aviation Aircraft Accidents with Uninvolved 3rd Party Fatalities 1978 to July 2019 (continued)

Date	Location of Accident	Total Fatalities	Uninvolved 3rd Party Fatalities	Short Description	Accident report extract
03/07/1998	LONG MYND (Shropshire)	1	1	On landing, glider's left wing struck & killed a person walking along a track adjacent to landing strip.	A group of 13 people attended the gliding club for an evening of flying experience. After the initial briefing, 2 of the ladies in the group declined the opportunity to fly. Those who were to fly were taken by vehicle along a gravel track to the launch point while the 2 ladies walked along the same route, arriving at the launch site after a further briefing had taken place. The pilot involved in the accident was on his 5th & last flight of the evening. Previously he had been landing at the southern end of the airfield but decided to make his final landing on the 'Vega Strip' close to the club house & hangars. As the a/c lined up for final approach, the pilot saw 2 people on the track which runs parallel to the landing strip, who "seemed to be stationary & not in a dangerous position". He noticed them several times during his landing scan but was not aware of their position at touch down. The passenger also saw the 2 people but did not mention them to the pilot until the a/c was on the ground. Shortly after touchdown both pilot & passenger felt & heard a thump. Once the a/c came to a stop the pilot got out to investigate & realised that one of the ladies had been struck by the glider's left wing. A subsequent medical examination determined that the lady, who had been struck on the back of her head, had died instantly. The investigation found that adequate signs & safety measures were in place to inform & protect members of the public walking close to or crossing the gliding site using public rights-of-way. However, the track adjacent to the 'Vega Strip' is not a public right-of-way & therefore needed no warning signs. Neither of the ladies were aware of any danger associated with walking along the track & had received no briefing in this respect. As a result of the accident additional safety measures have been introduced by the club. Although it could be argued that the lady who lost her life was involved in the activity, in that she had been invited to the airfield and briefed on some of the activity, given the full detail of the report we have included this in the uninvolved third-party consideration: The full AAIB report can be seen here: AAIB Report ASK 21 Glider BGA No FWQ
09/03/2009	Long Marston (Warwickshire)	1	1	Gyroplane collided with pedestrian on the ground who was fatally injured. Police and AAIB Field investigation.	There was a police investigation into the accident involving a Hunter Supporter, but the exact circumstances of this accident are not clear. The BBC initially reported: "Murder probe after aircraft death – two people have been arrested on suspicion of murder after a hunt supporter died when he was hit by a gyrocopter at an airfield." Subsequently the BBC reported on 17 March 2010 that the "Gyrocopter Pilot was found not guilty of killing the hunt supporter who was struck by the machine's propeller."

General Aviation Aircraft Accidents with Uninvolved 3rd Party Fatalities 1978 to July 2019 (continued)

Date	Location of Accident	Total Fatalities	Uninvolved 3rd Party Fatalities	Short Description	Accident report extract
22/08/2015	Shoreham (West Sussex)	11	11	Aircraft destroyed in air show crash. One POB seriously injured. 11 ground fatalities.	"Hawker Hunter G-BXFI crashed on to the A27, Shoreham Bypass, while performing at the Shoreham air show, fatally injuring elven road users and bystanders. A further 13 people, including the pilot, sustained other injuries." (AAIB Aircraft6 Accident Report 1/2017) The AAIB Special Bulletins and final report can be found here: https://www.gov.uk/aaib-reports/aircraft-accident-report-aar-1-2017-g-bxfi-22-august-2015 and concluded that the causal factors of the accident were: > "The aircraft did not achieve sufficient height at the apex of the accident manoeuvre to complete it before impacting the ground, because the combination of low entry speed and low engine thrust in the upward half of the manoeuvre were insufficient. > An escape manoeuvre was not carried out, despite the aircraft not achieving the required minimum apex height" The CAA also conducted a Review of Air Display activity in the UK the Report together with links to the Progress Report and the Action Report can be found here: http://publicapps.caa.co.uk/modalapplication.aspx?catid=1&pagetype=65&appid=11&mode=detail&id=7318 In response to an AAIB recommendation the DfT contracted Helios to conduct an independent review of the governance of flying display activity in the UK which can be found here: https://www.gov.uk/government/publications/review-of-uk-civil-flying-display-and-special-event-governance This was the worse air show disaster in the UK since a crash at the Farnborough air show in 1952 when a de Havilland DH.110 jet (later the Sea Vixen) broke up in flight having suffered a structural failure killing 29 people in the crowd.

Green Paper Aviation 2050 – Comments by Mr John Thorpe on 'Review the Approach to General Aviation Safety'

1.0. Introduction

Having been involved hands-on in General Aviation Safety for 40 years, as detailed below, it was felt appropriate to make certain data available for discussion together with some brief comments:

> Civil Aviation Authority for 30 years including becoming Head of General Aviation Safety Promotion,

> lecturer on Instructor Courses with the Examiner Training Agency,

> Chief Executive of the General Aviation Safety Council for seven years

> current an Honorary Member of the General Aviation Safety Council

> personally compiled a unique 40-year data base of **FATAL** accidents from 1980 to 2018 both in the UK and abroad covering UK registered general aviation aircraft of 5,700 kg and less.

2.0. Previous Strategic Review

As a result of a 2005 initiative by the then CAA Chairman; after a massive amount of work in cooperation with relevant organisations a 'Strategic Review of General Aviation in the UK was published in July 2006 by the CAA. The 150-page review was comprehensive and thorough and included 14 Recommendations, a number of which have not yet been fully implemented. This work should not be overlooked even though it was some years ago.

3.0. Personal Data Base

During the last 20 years I have by confining the data to fatal accidents, analysed in detail the 652 accidents enabling the most significant results to be highlighted. Each event has been classified into just ONE Type of Accident, however, the many Factors and Features have been indexed into four broad headings, Pilot Knowledge & Skill, Stretching the Limits, External Factors and Survival. In many cases the Factors and Features are not accident causes, eg an expired C of A is not a cause when someone flies into a cloud covered hilltop.

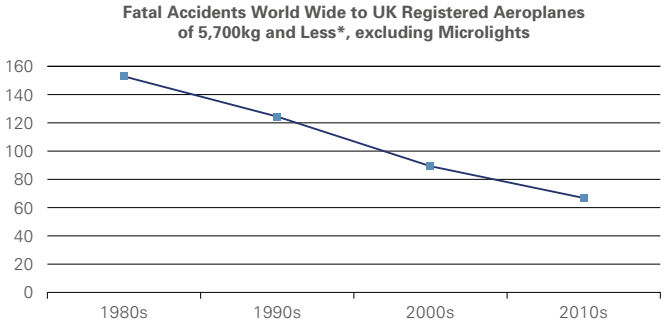
4.0. Some Points from 40 Years of Fatal UK GA Accident Data

4.1. The numbers of fatal accidents in each class of UK Registered general aviation aircraft of 5,700 kg and below between 1980 and 2018 is shown below in Table 1. It includes accidents in the early days of unregulated microlighting as well as the first generation of gyroplanes. The percentage of aircraft losses is shown based on the number on the UK Register in 2015.

Table 1. Type of Aircraft

Type of Aircraft	Fatal Accidents	Percentage based on number on 2015 UK Register
Aeroplanes	428	7%
Helicopters	96	12%
Microlights	100	4%
Gyroplanes	24	13%
Balloons & Airships	4	0.5%
TOTAL	**652**	**-**

4.2. With almost four decades of data, and a large sample size, the number of fatal aeroplane accidents per decade improves by between 17 and 25%, in the 1980s there was an average of 15 per annum, in the 2010s it is down to an average of 6 per year (see fig 1 below). The hours flown per decade are known to have reduced; accurate data is not readily available. This graph could be regarded as a measure of success in improving safety.



* **Includes** self launching (touring) motor gliders Because the total number of accidents (1980 to 2018) involving a combination of microlights, helicopters, balloons/airships and gyroplanes only totals 224 compared with the 428 to aeroplanes, the trends by decade for each of these other classes is not feasible.

4.3. Type of Accident (see Table 2) The data covers the years 1980 to 2017 as a number of Accident reports for 2018 are not yet available. The table shows that loss of control VFR in aeroplanes, microlights and gyroplanes is the main type of accident, whist in helicopters it is loss of control in IMC and at night. The table also shows that in all classes the succeeding Types of Accident varies considerably with the class of aircraft.

4.4. Index of Factors and Features (see Table 3) The 10 most frequently indexed (many per accident) items shows that stall/spin features in 39% of aeroplane accidents and stall in 31% of microlight accidents. It should also be noted that in between 37% and 47% of accidents either flying, licensing or aircraft rules had been broken making the flight technically illegal.

5.0. Some Points to Note

5.1. Fig 1 shows a steady downward trend in the number of fatal accidents. Although influenced by the decline in flying hours in some sectors of aviation, it almost certainly reflects the safety influence resulting from the work of the CAA, the relevant Organisations and others including the General Aviation Safety Council, the Airprox Board, the Air Accidents Investigation Branch and the Aircraft Owners and Pilots Association.

5.2. As Table 3 reveals, in a high percentage of fatal accidents, there were legal irregularities, which indicates that changes in legislation are unlikely to have any effect - it may be that the sort of pilot who flouts the rules, is more likely to have a fatal accident. Thus, it would appear that education is the best way to influence safety. This is borne out by the percentage of cyclists who wear head protection without it having been made compulsory.

5.3. In Table 4 it can be seen that the percentage of aeroplane accidents due to loss of control VFR is increasing with each decade, this is partly influenced by the significant decrease in some e.g. low flying/aerobatics and CFIT where modern sat nav equipment has become commonplace in the last two decades. Many Types of Accident have remained almost unchanged across the decades.

5.4. Although not included in the data presented, it is notable that in the last 20 years 15% of fatal general aviation accidents have occurred outside the UK whereas only a small percentage of flying by UK registered aircraft is outside the UK. This may be due to pilots unused to higher ground than pilots are used to in the in the UK, different weather patterns and variable or different air traffic services.

6.0. Conclusions

6.1. Education appears to be more effective than legislation in reducing accidents.

6.2. In order to maintain the downward trend in fatal accidents, effort and resources by all parties must be maintained. The law of diminishing returns means that at some point in the future an 'irreducible minimum' will be reached.

6.3. New measures to reduce the percentage of loss of control VFR/ stall spin accidents needs to be sought.

6.4. Special attention should be drawn to the small helicopter risk of loss of control at night and in bad weather.

6.5. Special attention or training needs to be implemented for those planning to fly outside the UK.

John Thorpe, FRAeS, 24th September 2019

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Comments on 'Review the Approach to General Aviation Safety' in Green Paper Aviation 2050

Data Table Definitions - Type of Accident (ONE per accident) with likely Index possibilities

Controlled Flight into Terrain - (CFIT)	impact with high ground en-route while under control. **Excludes** low on approach. Index - *inexperienced, continued adverse weather*, rules broken, safety height, navigation error, planning, peer pressure ATC, documentation, icing, weather inaccurate, night
Loss of Control VFR	failing to maintain control while flying in visual conditions, either at high speed or more generally at low speed. **Includes** loss of rotor rpm in gyros and helicopters. **Excludes** Loss of control during aerobatics and beat–ups. Index - *inexperienced, recency, pre-flight inspection, Stall/spin, asymmetric, out of fuel, drugs, fatigue, alcohol, weight and balance*
Low Aerobatics/flying	performing aerobatics too low, losing control or colliding with obstructions/ground while low flying. **Includes** low flying and aerobatics at or while practicing for air displays. Index - *alcohol, stall/spin, spectators, rules broken, display*
Collision Ground Object	striking objects on take-off, over-running runway or striking obstructions such as trees or masts when attempting to remain VFR. **Excludes** forced and precautionary landings, low approaches and collisions while deliberately low flying. Index - *safety height, performance, weight and balance*
Loss of Control in IMC	loss of control whilst in cloud or at night. Index - *instrument recency, continued adverse weather, aircraft limitations, asymmetric, disorientation, stall/spin, rules broken, night*
Mid-Air Collision	**includes** cases where the occupants survived but the other party did not. Index - *military operations, racing, inexperience*
Airframe Failure	where structure, controls or rotorcraft blades fail catastrophically in flight. **Excludes** structural failure during attempted recovery from loss of control (see Index 'structural break-up') Index - *pre-flight, maintenance, turbulence/downdraft, aircraft limitations, design*
Forced Landing	where pilot has little choice about landing site. **Includes** precautionary landing, abandoned take-off and ditching. Index - *stall/spin, out of fuel, ditching, technical, system mismanaged, icing, maintenance, wrong fuel*
Low Approach	striking the ground or objects whilst too low on approach to land. CFIT confined to en-route. Index – *instrument recency, procedures, continued adverse weather, peer pressure, rules broken*
Medical/Suicide	pilot collapse or incapacitation & suicide as determined by a Coroner's Inquest Index - *drugs*
Prop/rotor	where a passenger/other occupant or third party is killed by impact with a propeller/rotor while the aircraft is in flight or intending to be flown or by striking part of the aircraft. Index - *supervision*

Definitions – Index/Factors that occur in 10 Most Frequent Table

Note: Many items may not necessarily have contributed to the accident but have been revealed during the course of the investigation as having safety or regulatory implications.

Pilot Knowledge/Skill (Note: *pilot error* and *poor decision making* NOT used as they apply to nearly all fatal accidents)

- Control input (incorrect or too late)
- Inexperience (low hours for the flight being made)
- Lookout (includes cables and obstructions)
- Procedures (not followed)
- Unfamiliar aircraft (low hours on type, includes microlight change to/from 3 axis/weight shift)

Stretching the Limits

- Aircraft limitations (**excludes** performance, weight and balance, rotor rpm in gyros & helicopters as these are stand-alone items)
- Continued adverse weather
- Disorientation
- Distraction
- Peer pressure (includes commercial pressure and get-there-it is)
- Rotor rpm (failed to maintain in helicopters and gyros)
- Rules broken:
  - /aircraft (C of A, Permit, maintenance out of date or missed, maintenance not recorded
  - /flying (outside licence privileges, flouting ANO, exceeding aircraft limitations)
  - /licence (validity including medical, C of E and Log Book records)
- Stall/spin
- Structural break-up (overstressed or consequences of loss of control, including rotor rpm etc)

External factors

- Cables (striking or trying to avoid pylons, masts and wires)
- Design (problem or feature)
- Detached (part detaching & causing accident, excludes pieces falling as a result of loss of control)
- Maintenance (includes build standard)
- Technical:
  - /engine
  - /prop-rotor
  - /structure

John Thorpe, November 2019

Fatal Injury Accident Comparison by State – 2008-19*
UK CAA – Safety Performance and Risk Team

Overview

This document contains an overview of occurrences involving general aviation aircraft or activity that resulted in fatal injuries being sustained; reported to have occurred between the date range specified below, for EU member states, the USA, Australia, Canada and New Zealand.

Date Range Used

January 01. 2008 to August 31. 2019 (where available)

Sources used:

UK fatal injury accident data extracted from ECCAIRS

European state fatal injury accident data extracted from the European Central Repository

United Stated fatal injury accident data extracted from NTSB database

Canadian fatal injury accident data extracted from Canadian occurrence reporting database

Australian fatal injury accident data extracted from ATSB database

New Zealand fatal injury accident data extracted from NZ CAA database

Additional data referenced in the references slide

Data and rates contained within this document are subject to change as additional information becomes available or as records are updated following completion of any ongoing investigation.

Fatal Injury Accident Rates by State – 2008-19*

The below table provides a comparison of fatal injury accident rates, expressed as a rate per 100,000 hours for General Aviation between Jan 2008 and Aug 2019.

Year	GBR United Kingdom	AUS Australia	USA United States	NZL New Zealand	GBR United Kingdom	AUS Australia	USA United States	NZL New Zealand	GBR United Kingdom	AUS Australia	USA United States	NZL New Zealand
2008	10	39	222	4	1052732	1439000	16000000	500000	0.95	2.71	1.39	0.80
2009	20	19	227	3	995934	1468000	15500000	500000	2.01	1.29	1.46	0.60
2010	8	22	222	5	936847	1426000	14500000	500000	0.85	1.54	1.53	1.00
2011	13	29	237	8	909135	1355000	13500000	490000	1.43	2.14	1.76	1.63
2012	12	37	221	13	841439	1280000	12480000	490000	1.43	2.89	1.77	2.65
2013	9	31	157	7	815609	1289000	11167161	500000	1.10	2.40	1.41	1.40
2014	9	23	211	6	844287	1206000	10677976	400000	1.07	1.91	1.98	1.50
2015	15	16	183	1	869463	1192000	12086050	390000	1.73	1.34	1.51	0.26
2016	13	13	160	3	980780	1301000	11546755	380000	1.33	1.00	1.39	0.79
2017	14	16	155	5	871131	1237100	11477869	267000	1.61	1.29	1.35	1.87
2018	6	-	175	9	906763	1242380	11391162	193000	0.66	-	1.54	4.66
2019	3	-	135	3	942394	1271054	11681420	164900	0.32	-	1.16	1.82
Total	132	245	2305	67	10966514	13193100	152008393	4774900	1.20	1.86	1.52	1.40

Calculation to 2017

Legend

Estimated Data

Estimated Data for Australian General Aviation Safety Review

Notes

Utilization data for New Zealand has been extrapolated from a General Aviation study carried out by the Australian Transport Safety Bureau in 2017, with the later years estimated using a linear regression equation (see references slide for more details).

General Aviation accident numbers have been compiled based on the aircraft type involved (MTOW <5,701kg and the operation type stated in the accident report, this includes ex-military aircraft operated for pleasure purposes e.g. air display).

Data for 2019 is subject to change as this year has not concluded at the time of report production.

Fatal Injury Accidents by State – 2008-19*

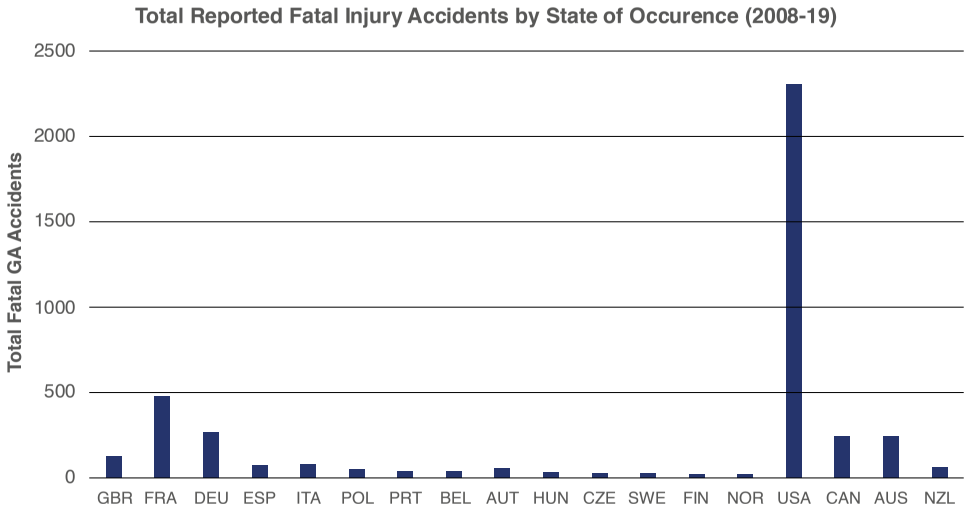
The below table details the number of fatal injury accidents reported for General Aviation activities between Jan-2008 and Aug-2019 by Country/State.

Year	GBR United Kingdom	FRA France	DEU Germany	ESP Spain	ITA Italy	POL Poland	PRT Portugal	BEL Belgium	AUT Austria	HUN Hungary	CZE Czech Republic	SWE Sweden	FIN Finland	NOR Norway	USA United States	CAN Canada	AUS Australia	NZL New Zealand
2008	10	46	30	0	5	0	1	2	6	3	0	4	1	2	222	28	39	4
2009	20	54	22	1	8	2	6	2	6	4	1	3	3	1	227	22	19	3
2010	8	43	18	4	4	1	5	5	9	3	0	1	2	3	222	20	22	5
2011	13	52	26	4	11	0	0	3	11	3	0	1	2	0	237	18	29	8
2012	12	30	31	3	3	1	6	2	4	1	1	5	4	2	221	30	37	13
2013	9	41	26	6	3	0	2	6	3	1	0	4	4	0	157	22	31	7
2014	9	33	16	2	12	4	5	5	4	2	1	2	4	1	211	13	23	6
2015	15	44	23	9	7	8	5	4	5	3	3	3	0	3	183	21	16	1
2016	13	28	22	14	2	11	1	0	6	3	9	0	0	1	160	23	13	3
2017	14	35	18	13	9	11	4	0	3	4	4	1	1	3	155	13	16	5
2018	6	52	23	11	8	9	2	6	5	3	5	1	1	3	175	18	-	9
2019	3	20	14	9	10	4	3	3	2	2	3	2	2	4	135	18	-	3
Total	132	478	269	76	82	51	40	38	64	32	27	27	24	23	2305	246	245	67

Notes

The number of fatal injury accidents was found to vary significantly across the countries/states included in this comparison.

The USA was found to have a significantly higher number of general aviation related fatal accidents, however this is offset by a higher number of hours which produces a fatal injury accident rate consistent with that seen in the United Kingdom.



Fatalities by State – 2008-19*

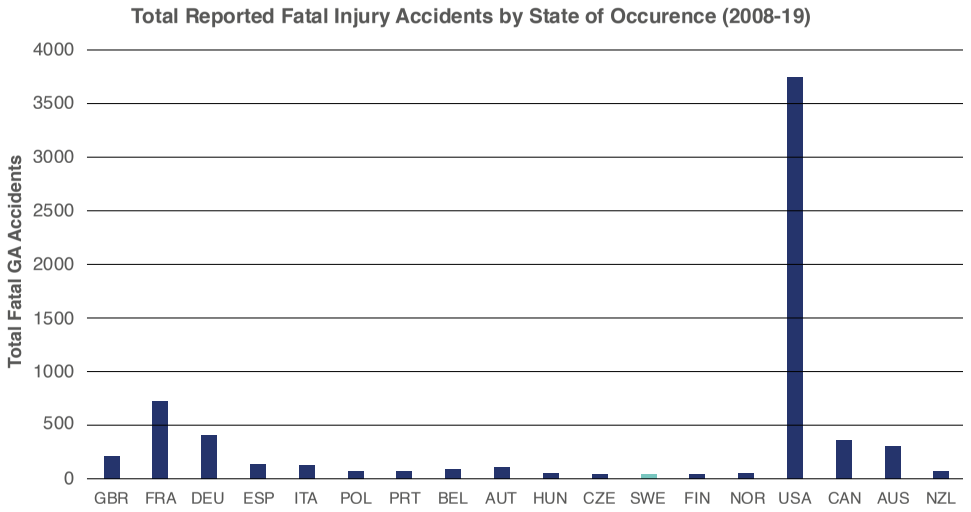
The below table details the number of fatal injuries reported for General Aviation activities between Jan-2008 and Aug-2019 by Country/State.

Year	GBR United Kingdom	FRA France	DEU Germany	ESP Spain	ITA Italy	POL Poland	PRT Portugal	BEL Belgium	AUT Austria	HUN Hungary	CZE Czech Republic	SWE Sweden	FIN Finland	NOR Norway	USA United States	CAN Canada	AUS Australia	NZL New Zealand
2008	17	65	42	0	10	0	1	4	10	5	0	5	3	4	373	41	37	8
2009	29	83	37	1	12	2	9	2	12	4	3	4	4	1	371	30	25	3
2010	14	68	30	7	5	2	8	7	12	5	0	1	3	5	363	30	22	7
2011	17	80	36	8	16	0	0	6	22	5	0	2	2	0	388	26	37	6
2012	15	46	58	6	4	1	10	4	12	1	2	7	6	5	325	42	38	7
2013	13	68	46	12	6	0	2	31	3	1	0	4	7	0	266	33	44	3
2014	12	55	29	2	19	4	7	7	5	3	1	2	11	2	317	18	28	5
2015	33	58	27	19	12	10	8	6	7	5	4	3	0	4	297	31	30	5
2016	16	33	31	27	3	14	1	0	7	7	12	0	0	1	299	28	19	3
2017	26	48	21	19	12	15	6	0	5	6	5	1	1	5	248	19	26	8
2018	10	83	27	16	9	10	2	7	4	4	9	1	1	6	290	26	-	6
2019	6	25	18	19	14	3	5	5	4	2	5	10	2	10	213	30	-	3
Total	208	712	402	136	122	61	59	79	103	48	41	40	40	43	3750	354	306	61

Notes

The number of fatal injuries was found to vary significantly across the countries/states included in this comparison.

The USA was found to have a significantly higher number of general aviation related fatalities, however this is offset by a higher number of hours which produces a fatal injury accident rate consistent with that seen in the United Kingdom.



Fatalities per accident by State – 2008-19*

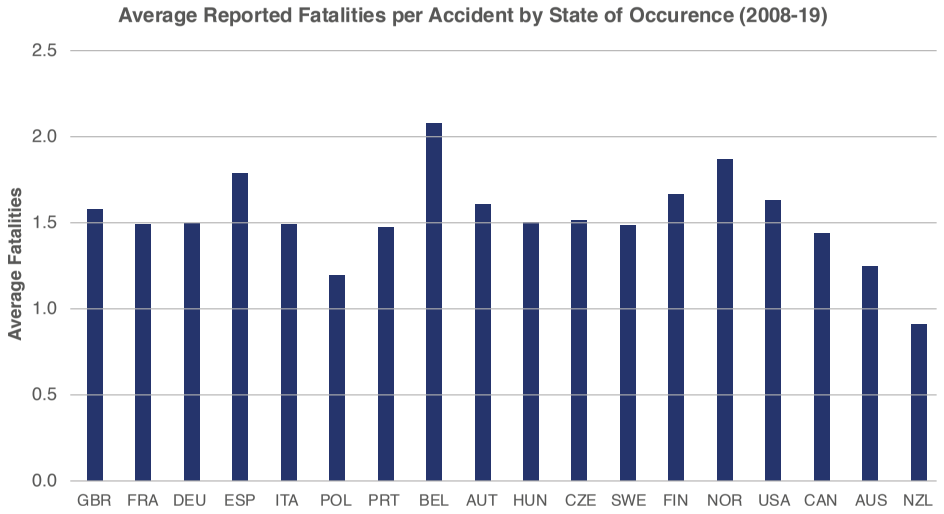
The below table details the number of fatal injuries per accident reported for General Aviation activities between Jan-2008 and Aug-2019 by Country/State.

Year	GBR	FRA	DEU	ESP	ITA	POL	PRT	BEL	AUT	HUN	CZE	SWE	FIN	NOR	USA	CAN	AUS	NZL
	United Kingdom	France	Germany	Spain	Italy	Poland	Portugal	Belgium	Austria	Hungary	Czech Republic	Sweden	Finland	Norway	United States	Canada	Australia	New Zealand
2008	1.7	1.4	1.4	-	2.0	-	1.0	2.0	1.7	1.7	-	1.3	3.0	2.0	1.7	1.5	0.9	2.0
2009	1.5	1.5	1.7	1.0	1.5	1.0	1.5	1.0	2.0	1.0	3.0	1.3	1.3	1.0	1.6	1.4	1.3	1.0
2010	1.8	1.6	1.7	1.8	1.3	2.0	1.6	1.4	1.3	1.7	-	1.0	1.5	1.7	1.6	1.5	1.0	1.4
2011	1.3	1.5	1.4	2.0	1.5	-	-	2.0	2.0	1.7	-	2.0	1.0	-	1.6	1.4	1.3	0.8
2012	1.3	1.5	1.9	2.0	1.3	1.0	1.7	2.0	3.0	1.0	2.0	1.4	1.5	2.5	1.5	1.4	1.0	0.5
2013	1.4	1.7	1.8	2.0	2.0	-	1.0	5.2	1.0	1.0	-	1.0	1.8	-	1.7	1.5	1.4	0.4
2014	1.3	1.7	1.8	1.0	1.6	1.0	1.4	1.4	1.3	1.5	1.0	1.0	2.8	2.0	1.5	1.4	1.2	0.8
2015	2.2	1.3	1.2	2.1	1.7	1.3	1.6	1.5	1.4	1.7	1.3	1.0	-	1.3	1.6	1.5	1.9	5.0
2016	1.2	1.2	1.4	1.9	1.5	1.3	1.0	-	1.2	2.3	1.3	-	-	1.0	1.9	1.2	1.5	1.0
2017	1.9	1.4	1.2	1.5	1.3	1.4	1.5	-	1.7	1.5	1.3	1.0	1.0	1.7	1.6	1.5	1.6	1.6
2018	1.7	1.6	1.2	1.5	1.1	1.1	1.0	1.2	0.8	1.3	1.8	1.0	1.0	2.0	1.7	1.4	-	0.7
2019	2.0	1.3	1.3	2.1	1.4	0.8	1.7	1.7	2.0	1.0	1.7	5.0	1.0	2.5	1.6	1.7	-	0.0
Total	1.6	1.5	1.5	1.8	1.5	1.2	1.5	2.1	1.6	1.5	1.5	1.5	1.7	1.9	1.6	1.4	1.2	0.9

Notes

The data would suggest that the average number of fatalities resulting from a general aviation accident is broadly consistent across EU member states and the USA at around 1.6 fatalities per fatal injury accident.

New Zealand was found to have the lowest rate of fatalities per fatal injury accident which may be driven by a aircraft generally being flown with 1 person on board.



References Used

The following sources were used in the is data comparison and can be accessed using the links provided below:

Source Name	Description	Link
ATSB (Australia) Online Dashboard	Online dashboard produced by the Australian Transport Safety Bureau (ATSB) used to populate hours and fatal accident data for Australian General Aviation.	http://www.atsb.gov.au/publications/2018/ar-2018-030/
Australian General Aviation Safety Review	Data used to populate fatality statistics for New Zealand and Australia, based on comparisons made between the 2 aviation sectors.	https://www.bitre.gov.au/publications/2017/cr_001.aspx
New Zealand Aviation Safety Review	Data used to populate hours and confirm number of fatal injury accidents involving New Zealand registered aircraft or occurrences in New Zealand.	https://www.aviation.govt.nz/assets/publications/aviation-industry-safety-updates/2017-2-Aviation-Update.pdf
USA Accident and Incident Database	Data used to create list of fatal injury accidents for US registered aircraft, or occurrences in the USA.	https://www.ntsb.gov/_layouts/ntsb.aviation/index.aspx
Canadian Accident and Incident Reporting Database	Data used to create list of fatal injury accidents for Canadian registered aircraft, or occurrences in Canada.	http://www.bst-tsb.gc.ca/eng/stats/aviation/index.html
New Zealand Fatal Aviation Accident Listing	Data used to create list of fatal injury accidents for New Zealand registered aircraft, or occurrences in New Zealand.	https://www.aviation.govt.nz/safety/safety-reporting/fatal-accident-reports/

1.0. Cost Shared Flights What does good look like?

1.1. We found there has been much confusion in recent times between legally conducted cost shared flights and illegal public transport with some calling cost shared flights illegal commercial activity and would wish to see all such flights banned. This short paper aims to provide information on and clarify the following 5 issues:

> What are cost shared flights?

> Why should cost shared flights be allowed?

> Why are cost shared flights not commercial activity?

> What are the risks associated with a cost shared flight?

> How are the risks of a cost shared flight best managed?

2.0. What are cost shared flights?

2.1. Cost sharing flights are flights shared by private individuals. The 'cost-shared' part is in reference to the costs of the specific flight which can be shared only between the pilot and others onboard the aircraft. These costs are the 'direct costs' which are the costs directly incurred in relation to a specific flight (e.g. fuel, airfield charges, rental fee for an aircraft). **There can be no element of profit for the pilot as these flights are not commercial, and if profit is suspected then the flight might be operating outside of the regulations and therefore be illegal.** The pilot must pay a contribution to these direct costs.

2.2. The safety and conduct of any flight including cost-shared flights it the responsibility of the pilot in command of the aircraft. The pilot must conduct the flight in accordance with the applicable regulation for non-commercial flights with light aircraft by private pilots. It is also the pilot's responsibility to ensure the flight is appropriately insured, although passengers may want to check that any personal life, accident and/or health insurance they have is valid for non-commercial flights.

2.3. Passengers should be made aware that the pilot may amend or cancel the flight for any reason, including at short notice and that the proportion of the costs must be shared by the pilot. If the flight does not take place, then no remuneration (money or exchange of gifts) should be exchanged between the pilot and passengers.

2.4. Passengers are not taking part in a commercial flight but in a leisure flight with a private pilot. The pilot has a duty not to undertake any flight if the conditions are not suitable.

2.5. Where cost shared flights are arranged through online platforms the CAA recommends the use of only websites that have signed up to the European Aviation Safety Agency **"Charter to promote the safety of non-commercial General Aviation flight with light aircraft by flight sharing companies."**[96] Platforms that have signed up to this charter support the provision of appropriate information to both pilots and passengers and helps to ensure that cost-shared flights are conducted within the scope of the regulation.

3.0. Why should cost shared flights be allowed?

3.1. The principle of sharing the costs of journey in a private vehicle between the driver and any passengers is well and long established. For motor vehicles the law is:

Public Passenger Vehicles Act 1981 s1

> (4)For the purposes of this section a journey made by a vehicle in the course of which one or more passengers are carried at separate fares shall not be treated as made in the course of a business of carrying passengers if—

> (a)the fare or aggregate of the fares paid in respect of the journey does not exceed the amount of the running costs of the vehicle for the journey; and

> (b)the arrangements for the payment of fares by the passenger or passengers so carried were made before the journey began; and for the purposes of paragraph (a) above the running costs of a vehicle for a journey shall be taken to include an appropriate amount in respect of depreciation and general wear.

3.2. It is not unreasonable that similar provisions are made for private individuals for aircraft. The law around cost shared flights is slightly more restrictive than for vehicles it is for the direct costs of the flight and an additional amount for annual costs / depreciation and general wear is not included.

3.3. In addition to being consistent in the law for allowing private individuals to share the costs of a journey cost shared flights also allow pilots to conduct more flights and therefore gain more experience than if such arrangements did not exist. Safety data does not indicate that a properly and legally conducted cost shared flight carries any more risk than a similar non-commercial flight conducted without costs being shared.

4.0. Why are cost shared flights not commercial activity?

4.1. The main reason cost shared flights are not required to be governed by the commercial air transport rules is that they are not commercial activities seeking to make a profit or return on investment. No element of profit is allowed, and the pilot must share a proportion of the costs.

4.2. There are three main reasons why we apply a different rule set depending on whether or not a flight is commercial:

> There is an expectation from someone buying a ticket to travel from A to B with an AOC operator that a high level of safety will be achieved. Apply the same standard to private flying it would, in effect, eliminate private flying as it would be impossible to achieve the levels of safety achieved by Commercial Air Transport in the modern age.

> Safety can potentially be compromised in a competitive market. If Operator A is 'braver' than competing Operator B when making safety-related decisions, A will eventually prevail in the market… until it has a major accident, by which time B is long out of business. There is therefore a need for baseline safety rules below which AOC Operators are not permitted to go.

> In commercial operations there is an obligation to deliver on a contract / service commitment which influences decision making.

[96]Text taken from the CAA Website: http://www.caa.co.uk/General-aviation/Aircraft-ownership-and-maintenance/Cost-sharing-flights/

4.3. In purely private flying with passengers:

> We accept that light aircraft pilots and their passengers have much more control over the risk to which they are prepared to expose themselves. They can choose not to take part / get on the aircraft.

> There is no competitive market e.g. if you cancel a flight because of bad weather, there is no loss to the individual, you save cost. It is the element of loss of profit in commercial ops that is key. If you are just cost sharing you don't have to maximise the return on the asset to make a profit at the end of the year.

5.0. What are the risks associated with a cost shared flight?

5.1. The main risks of cost sharing flights are the same as for a non-cost shared flight carry passengers:

> Experience and currency of the pilot

> Pressure to complete the flight on the pilot, having agreed to fly other people

> Participants not being aware there is a difference between a private flight and a commercial flight

> Visibility of whether or not any money changes hands and is do whether or not that is within the direct costs of the flight. (This last one is more about regulatory compliance risk than safety risk but needs to be considered).

5.2. Once minimum compliance with currency has been met then, as for all non-commercial flights how the above risks (and the others that are associated with flying) are the responsibility of the pilot in command to manage and mitigate to ensure the safe conduct of the flight. We believe the CAA will have limited visibility of how these risks are managed on any given flight although the CAA can intervein and investigate if it believes there has been a transgression of the rules. It is the pilot that has both the reasonability and the means to manage the risks and it is only right that they should do so.

6.0. How are the risks of a cost shared flight best managed?

6.1. Whilst the risks and responsibility of conducting a safe and legal non-commercial flight, be it cost share or not, rest with the pilot one of the challenges for the regulator and for those who have concern about whether or not pilots are operating within the confines of the rules is the lack of visibility of how a given flight is conducted or what if any money exchanges hands. Until the recent amendments to the cost share rules the only way the regulator would find out how any flight was conducted would be to ask the pilot. The limitation here is clear any pilot potentially conducting an illegal activity is very unlikely to admit to it. Where passengers have also been briefed what to say to the regulator, if asked, and collude in illegal activity it becomes very difficult to cut out the illegal activity from that being legitimately conducted.

Beyond this the recent amendments to the cost share rules in the EASA regulations removed the previous UK restrictions on advertising, this has led to the emergence of cost sharing platforms to introduce pilots and riders for cost sharing flights. Whilst many have seen the advent of such platforms as a threat and go as far to say they encourage illegal public transport they also present an opportunity. Cost sharing platforms that sign up to the EASA Charter provide much more visibility of an activity that was previously invisible and provides an opportunity to better manage the risks of a non-commercial flight. A cost shared flight arranged directly with a pilot relies completely on the pilot to brief the passengers and manage the risks. It is not unreasonable to suppose this is done to varying standards. With the use of a good cost sharing platform the pilot and riders are both supported in the conduct of the flight and are likely to be better informed as a result. Using the risks above then the use of a cost sharing platform helps as follows:

> Experience and currency of the pilot – These are listed on the website for all to see. The provider of the platform checks the licence is valid and current and the medical is in date before a pilot is allowed to post a flight these additional checks help to ensure pilots are current and operating on valid licences and rating at the time of the flight.

> Pressure to complete the flight on the pilot, having agreed to fly other people – this always remains to a degree, but the cancelation of a cost sharing flight can be done at the touch of a button with no difficult conversation between the pilot and the riders. The site always stresses that the pilot's decision is final to reinforce the responsibility and control of the pilot in command.

> Participants not being aware there is a difference between a private flight and a commercial flight. Both pilots and riders are provided with pop-up boxes and the website and sent sperate e-mails setting out the nature of the flight.

> Visibility of whether or not any money changes hands and if it does, whether or not that is within the direct costs of the flight. (This last one is more about regulatory compliance risk than safety risk but needs to be considered.) The costs are recorded by the cost sharing platform provider and can be shared with the regulator if anything needs to be investigated. At least one platform has introduced software to automatically flag up flight costs that are more than the norm for a particular flight so that they can check the flight is operating within the rules.

6.2. This does not mean web-based platforms are perfect or that individual posts do not give the impression of flights being part of a business, but these deficiencies will best be addressed by working with web-based platform providers, either directly, or as part of the EASA Charter work. It appears a reasonable conclusion to make that a cost-shared flight conducted via a web-based flight sharing platform signed up to the EASA Charter is more likely be fully compliant with the rules. As well as having the risks of such flights more effectively managed than at least some of the flights arranged directly with the pilot which whether by error, lack of experience or deliberate act fall outside the strict confines of the regulation.