

2018

Survey of General Aviation Safety in Ireland

An online survey of the General Aviation (GA) community in Ireland was conducted in February 2018. Its purpose was to obtain the views of GA pilots regarding safety; to establish their perception of accident and serious incident causation; and to determine their experience levels and degree of currency (recent experience). This report outlines the results of the survey. Analysis, beyond that required to outline the results, is not provided.

This work was carried out as part of an MSc research project submitted in partial fulfilment of the requirements for the degree of Master of Science at Cranfield University. As such, it has not been peer-reviewed nor assessed in the context of professional research.



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1.0 General

1.1 Summary

An online survey of the General Aviation (GA) community in Ireland was conducted in February 2018. Its purpose was to obtain the views of GA pilots regarding safety; to establish their perception of accident and serious incident causation; and to determine their experience levels and degree of currency (recent experience). This report outlines the results of the survey. Analysis, beyond that required to outline the results, is not provided.

This survey was one element of an in-depth study of GA safety and accident and serious incident causation in Ireland, undertaken as part of a Safety and Accident Investigation MSC carried out through Cranfield University. The survey would not have been possible without the participation of the GA community in Ireland nor without the kind support of the General Aviation Safety Council of Ireland (GASCI) and Flying in Ireland, on whose websites the access link to the survey was hosted, and the Irish Light Aircraft Society (ILAS) and the National Microlight Association of Ireland (NMAI), who also promoted the survey.

The survey was completely anonymous. Ticking the consent form on its opening page granted access to the survey questions. The consent form also included a requirement that a participant conducted the majority of his or her GA flying in Ireland.

The maximum number of questions presented to participants was 37 (not including the request for consent). The survey was divided into eight sections: General Information (three questions); Flying Experience (six questions); Training (three questions); Aircraft Information (maximum of seven questions); Flight Preparation/Airspace Used (three questions), Club/Association Membership and Resources (maximum of four questions); Access to Safety Information (four questions); and General Aviation Safety (maximum of seven questions). Of the 37 questions, 30 required either a tick-box answer or a minimum amount of text, and seven required free-text responses. Five of the 37 questions were only displayed if certain answers were given to four of the questions. The survey, as presented to participants, is contained in Appendix A.

1.2 Completion Rates

In total, 161 responses were received. One respondent answered “*none*” to all questions relating to flying experience, and because GA flying experience was a prerequisite, further responses from this person were excluded. Nine respondents (5.6%) ticked the consent form, but did not answer any questions. The remaining 151 respondents answered the first two questions (pilot age and licence(s) held).

A total of 134 respondents (88.7% of 151) went on to answer the six questions relating to flying experience (Q4-Q9). Over 110 respondents (72.8% of 151) answered all of the remaining questions that were not previous-answer-dependent. The penultimate question was answered by 117 respondents (77.5% of 151). The final question (Q32) required a free-text response and was answered by 89 respondents (58.9% of 151).

Figure 1 below indicates the number of responses received for each question. Question 3 (shaded magenta) would only be answered if a respondent held the two additional qualifications listed (Flight Instructor and/or Flight Examiner). Questions 12, 22, 26, 27, 28 and 32 (shaded amber below) required a free-text response and this may have adversely affected the response rates for these questions. The second parts of ‘Q18 How’ (“*How were NOTAMS checked?*”) and ‘Q19 How’ (“*How was weather information checked?*”) (shaded red below) also required a free-text response. Questions 15A, 17A, 23A, 31A and 31B (shaded green) were only asked if certain answers were given to the preceding question in each case.

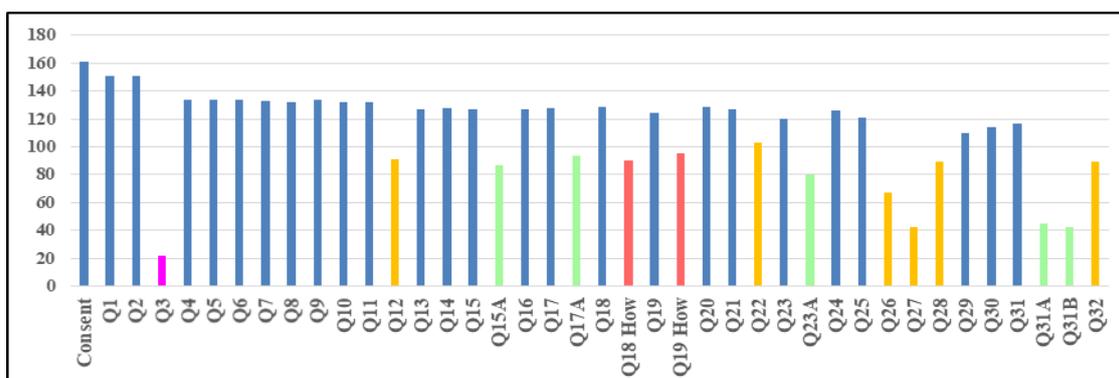


Figure 1: The number of respondents to each question

Survey completion rates are shown in **Table 1** below. The figure of 100 percent complete indicates that all 37 questions were answered (including Q3, which only applied to Flight Instructor and/or Flight Examiners, and those questions that were only asked if certain answers were given to the preceding question).

Table 1: Survey completion rates

Percentage Complete	Number of Respondents
70	15
80	65
90	40
100	5
Total $\geq 70\%$	125

1.3 Completion Time

The consent form advised potential respondents that the survey “*should take no more than 15 minutes to complete*”. A total of 95 respondents completed the survey in under 15 minutes.

2.0 Overview of Information Obtained

2.1 General Information.

The first three questions related to General Information.

Q1 asked to “*Please indicate your age*” from a selection of eight age groups. The number of responses received was 151. **Figure 2** below depicts the distribution of the age groups of the respondents.

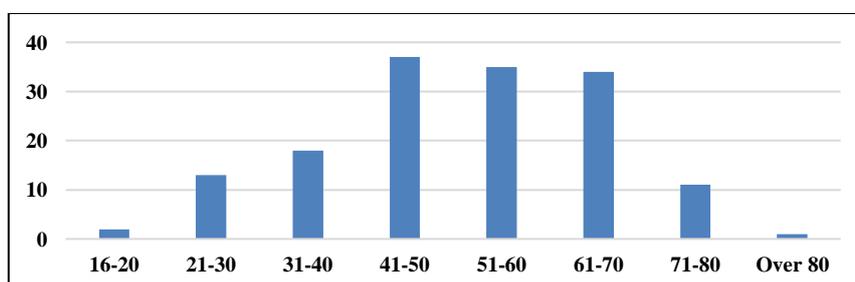


Figure 2: Distribution of age groups of respondents



Q2 asked “*What type(s) of licence(s) do you hold?*” Respondents were presented with seven options. As per the previous question, the number of responses received was 151. **Figure 3** below indicates the results. A total of 94 respondents (63.3%) indicated that they held a PPL. Five respondents held more than one licence type.

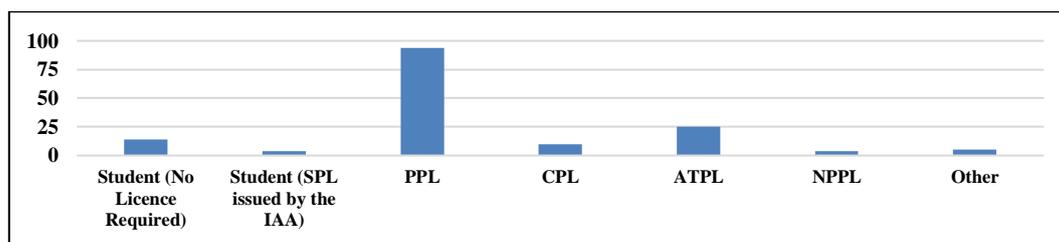


Figure 3: Licence(s) held

Q3 asked to “*Please indicate if you hold either (or both) of the following aviation qualifications: Instructor (FI) or Examiner (FE)*”. Only 22 responses were received. One respondent indicated that they only held a Flight Examiner qualification. The number of respondents that indicated they held a Flight Instructor qualification was 16. A further five indicated that they held both Flight Examiner and Flight Instructor qualifications.

2.2 Flying Experience

Six questions were asked in relation to flying experience. The results are presented in six boxplots (**Figure 4**). The features of the boxplots used are explained in **Figure 5**.

Q4 asked “*Approximately how many hours have you flown in total?*” A total of 134 responses were received. Two responses were excluded; one of these specified “*1,000’s*”, the other specified “*10,000 hrs plus*”. The remaining 132 entries ranged from one hour to 25,000 hours.

Q5 asked “*Approximately how many of the total hours flown were in General Aviation?*” As per the previous question, 134 responses were received, with experience levels ranging from one hour to 7,000 hours. The total GA hours for 103 of the respondents (76.9%) was 100% of their overall total.

Q6 asked “*Approximately how many General Aviation hours have you flown in the last 12 months?*” A total of 134 responses were received, with values ranging from zero to 350 hours. The number of respondents that indicated they had zero hours was 12. A further 19 respondents had flown 10 hours or less, while 12 had flown over 100 hours or more, two of whom had flown 350 hours each.

Q7 asked “*On approximately how many days have you flown GA aircraft in the last 12 months?*” Two of the 133 responses received were excluded because a figure was specified for hours flown in the past 12 months (Q6 – the previous question), yet “*0*” was entered for Q7 (this question). The remaining 131 respondents entered values ranging from zero to 200 days. Eight respondents indicated that they had flown on 100 days or more. A total of 33 indicated that they had flown on 10 days or less. Further details for these 33 responses are included in **Table 2** below. Responses were also used to calculate information regarding hours flown per day, which ranged from zero hours to five.

Table 2: Respondents who had flown on 10 days or less in the last 12 months (total 33)

No. of days flown on:	0	1	2	3	4	5	6	7	8	9	10
No. of respondents:	12	1	1	2	2	1	1	4	4	0	5



Q8 asked “Approximately how many landings have you performed in GA aircraft in the last 12 months?” In total, 132 responses were received. One response, which stated “200+”, was excluded, as it could have been any figure above 200. The remaining responses ranged from zero (12 respondents) to 2,000 (one respondent). A total of 23 respondents had performed 10 landings or less. The median value was 40 landings. To calculate landings per hour flown, all ‘zero’ entries were excluded. The remaining 120 responses were used in the calculation, with the answer rounded to the nearest whole number; the result ranged from one to 10 landings per hour flown, with a median value of two.

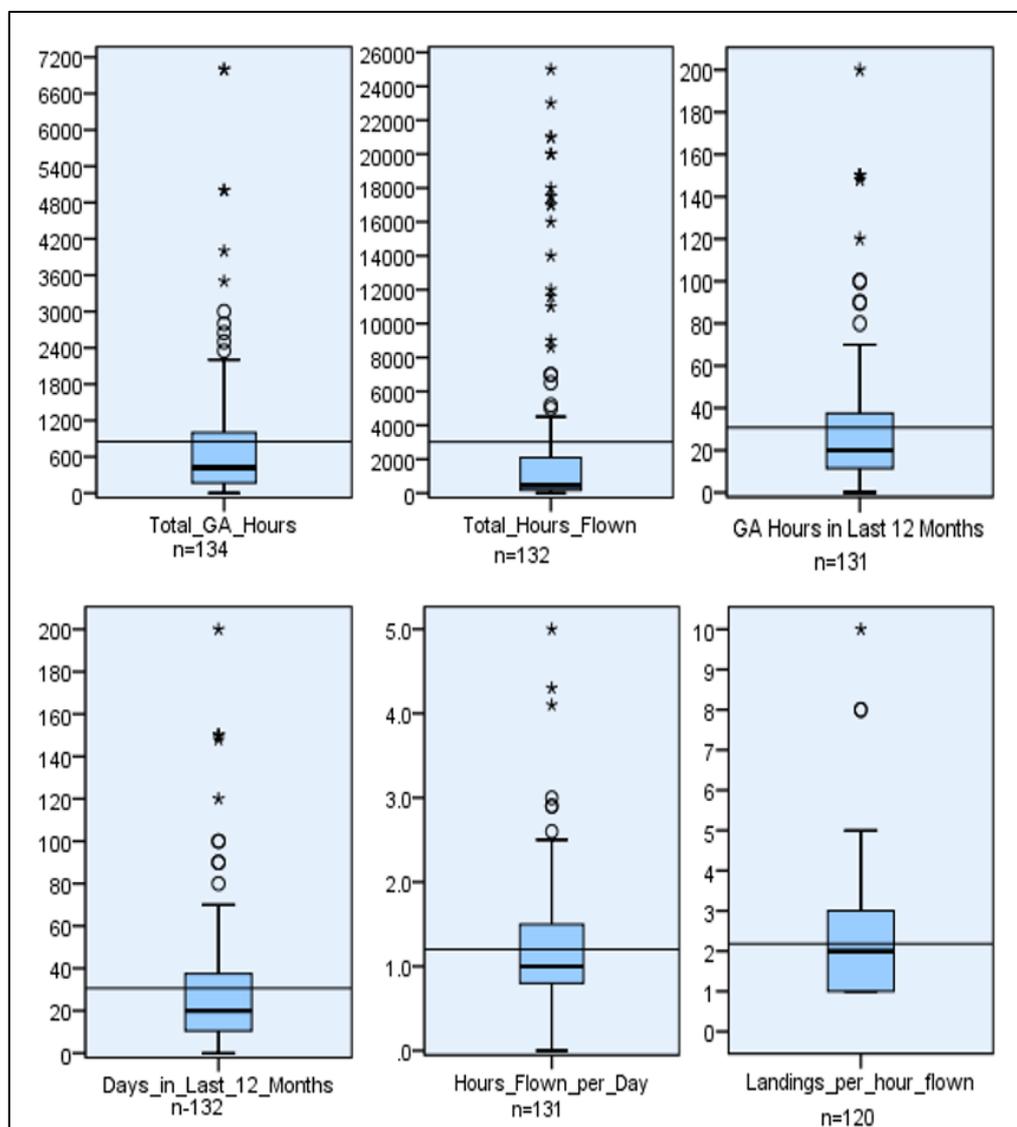


Figure 4: Pilots' flying experience (see **Figure 5** below for boxplot explanation)

2.2.1 Boxplots

With reference to **Figure 5**, the upper and lower quartiles each contain 25% of the sample size (the number of responses). The middle box contains 50% of the sample (interquartile range). Outliers are exceptionally high values ($1\frac{1}{2}$ - 3 box lengths from either end of the box). Extreme scores are even higher (>3 box lengths from either end of the box). The mean is the arithmetical average, whereas the median marks the mid-point of the data. Unlike the mean, the median is relatively unaffected by outliers and extreme scores; half the scores are greater than the median and half are less.

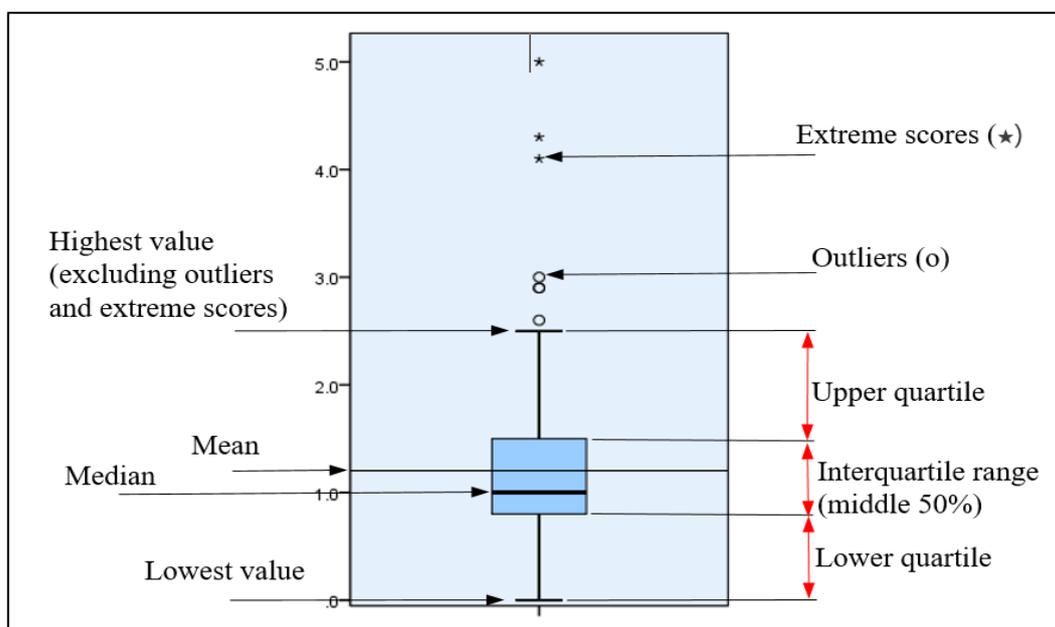


Figure 5: Boxplot key

Q9 asked “Do you also fly commercially?” Of the 134 responses received, 20 indicated that they did.

2.3 Training

Three questions were asked in relation to training.

Question 10 asked “How long ago was your last instructional flight?” Respondents were presented with a choice of six time periods. In total, 132 responses were received. **Figure 6** below depicts the results.

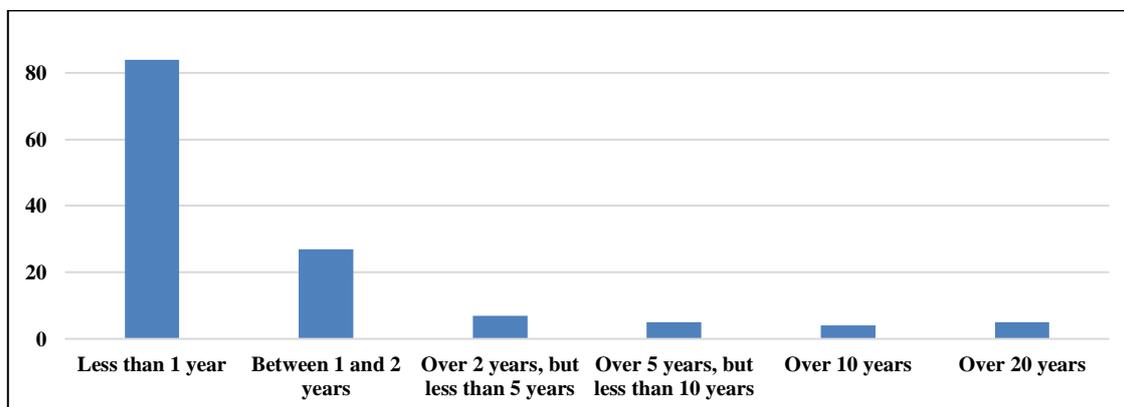


Figure 6: Time since last instructional flight

Q11 asked “Have you ever received Upset Recovery and Prevention Training?” Of the 132 respondents who answered this question, 67 (50.8%) indicated that they had received it and the remainder (65) indicated that they had not.



Q12 asked “*In terms of General Aviation, what other types of training would be of benefit to you as a pilot?*” A free-text response was required. A number of the 91 responses received included more than one suggestion. **Figure 7** below depicts the results.

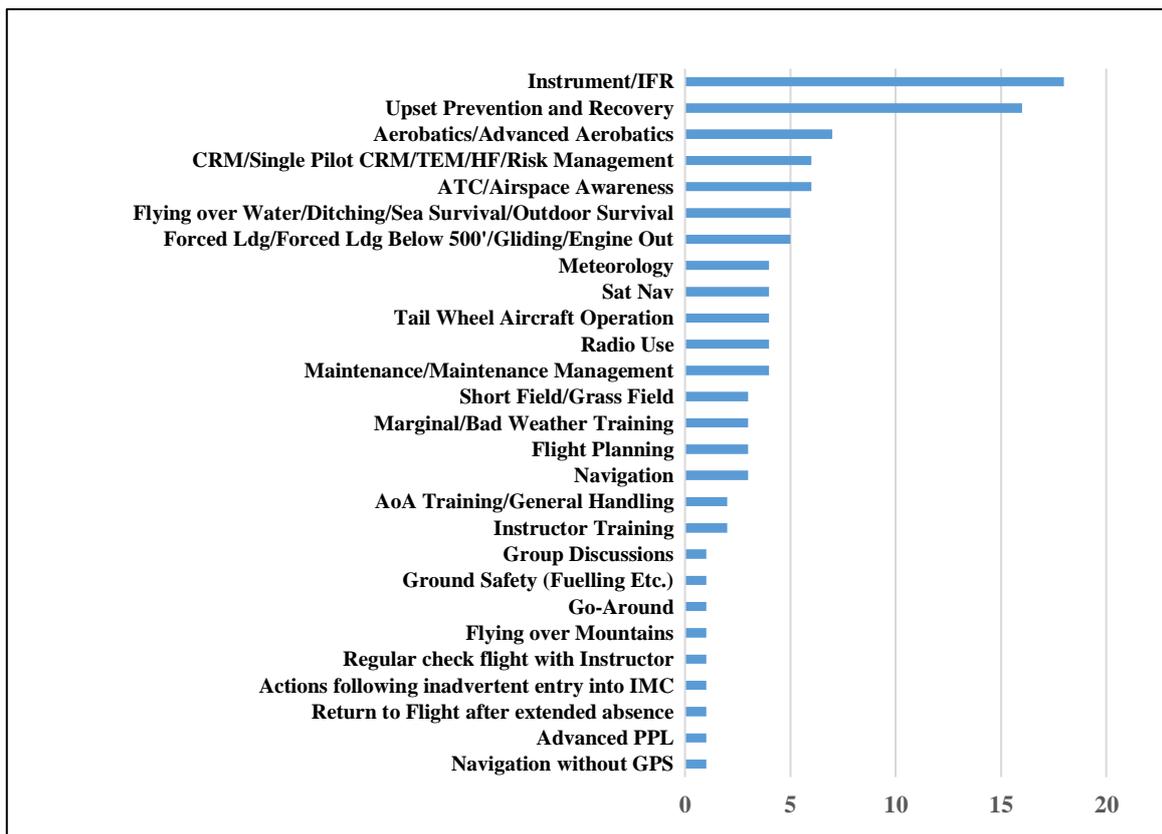


Figure 7: Other types of training that would be of benefit

2.4 Aircraft Information

Seven questions were asked in relation to Aircraft Information.

Q13 asked to “*Please indicate the type(s) of aircraft you normally fly*” (from a list of nine types and an “other” category). A total of 127 responses were received, with 37 of the respondents (29.1%) indicating that they flew more than one type. **Figure 8** below depicts the results.

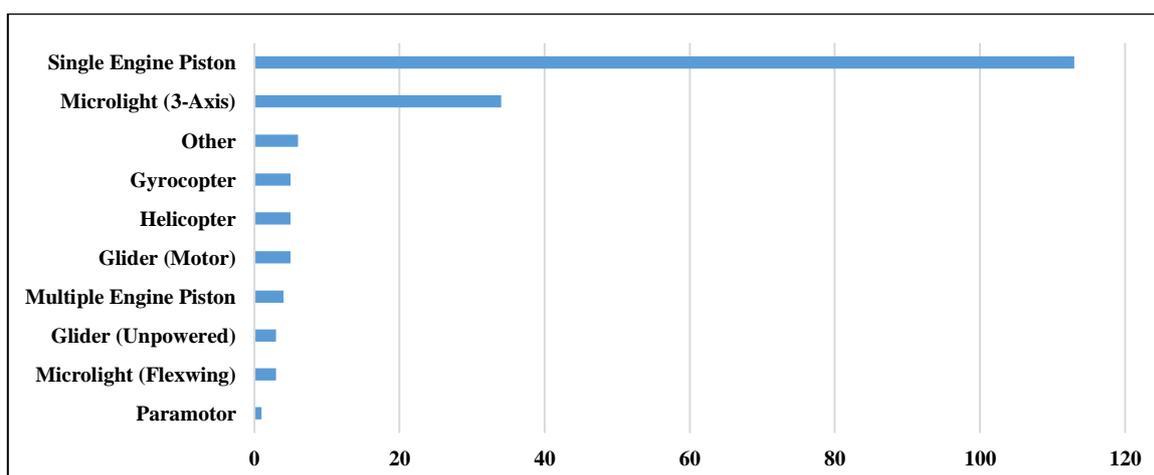


Figure 8: Type(s) of aircraft flown



Q14 asked “*Is the aircraft you mostly fly operating on a Flight Permit or a Certificate of Airworthiness?*” A total of 69 of the 128 respondents (53.9%) who answered this question indicated that the aircraft they flew was operating on a Flight Permit. The remaining 59 indicated the aircraft was operating on a “Certificate of Airworthiness”.

Q15 asked to “*Please indicate if you own, part-own or hire the aircraft you fly*”. In total, 127 responses were received, with 90 respondents (70.9%) indicating that they either owned or part-owned the aircraft. **Figure 9** below refers.

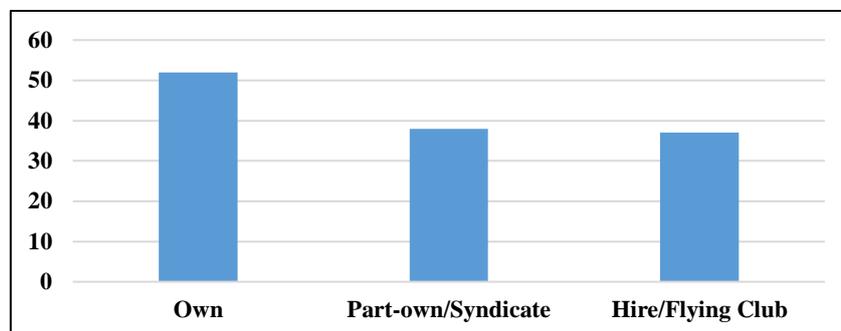


Figure 9: Aircraft ownership

Q15A asked “*If you own or part-own the aircraft, what country is it registered in?*” This question was only displayed if a respondent indicated that they owned or part-owned the aircraft. Respondents were presented with four options: “*Ireland*”, “*United Kingdom*”, “*United States*” and “*Other*”. A total of 87 responses from a possible 90 were received. **Figure 10** below depicts the results.

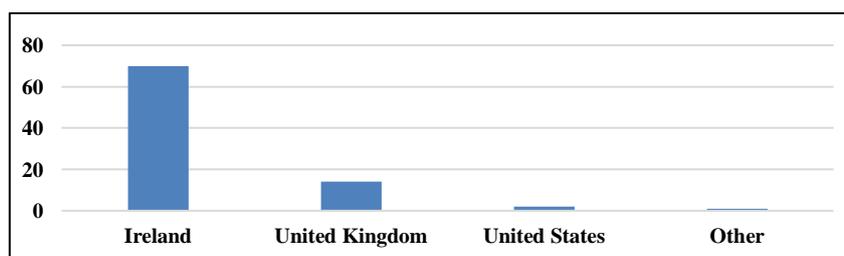


Figure 10: Country of registration

Q16 asked “*Where is the aircraft normally based?*” Two options were presented to respondents: “*Licensed Airfield*” or “*Unlicensed Airfield/Private Strip*”. The breakdown of the 127 responses received is shown in **Figure 11** below.

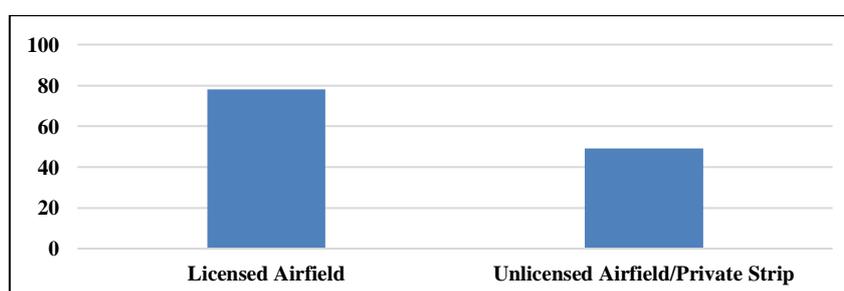


Figure 11: Where aircraft are based



Question 17 asked “Do you normally use a satellite navigation system?” In total, 128 responses were received, with 94 (73.4%) respondents indicating that they did.

Q17A was only displayed if a respondent indicated that they used satellite navigation and asked “Is it your primary navigation source or is it used for situational awareness only?” All 94 respondents whom the question was displayed to provided an answer, with 44 (46.8%) indicating that it was their primary navigation source. The other 50 indicated that it was for situational awareness only. **Figure 12** below applies to Q17 and Q17A.

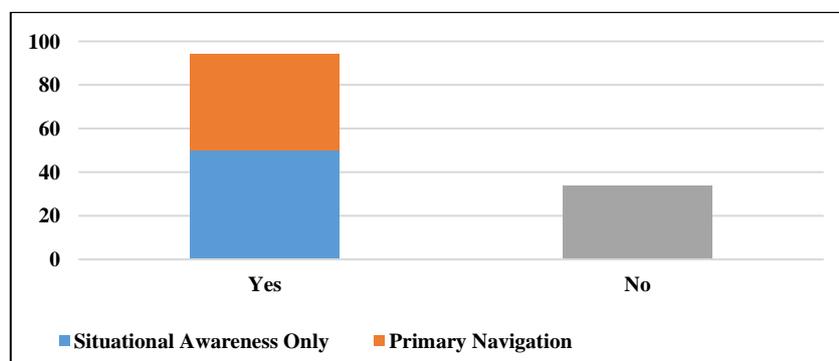


Figure 12: Use of satellite navigation system

2.5 Flight Preparation and Airspace Used

Three questions were asked in relation to Flight Preparation and Airspace Used.

Q18 asked “Do you routinely check NOTAMS before flight and if so, how?” In total, 129 responses were received, with 90 respondents (69.8%) indicating that they did and the remaining 39 indicating that they didn’t. Of the 90 who indicated that they routinely checked NOTAMS before flight, 66 (73.3%) indicated how this was done using the free-text field (Q18 How). **Figure 13** below depicts the results.

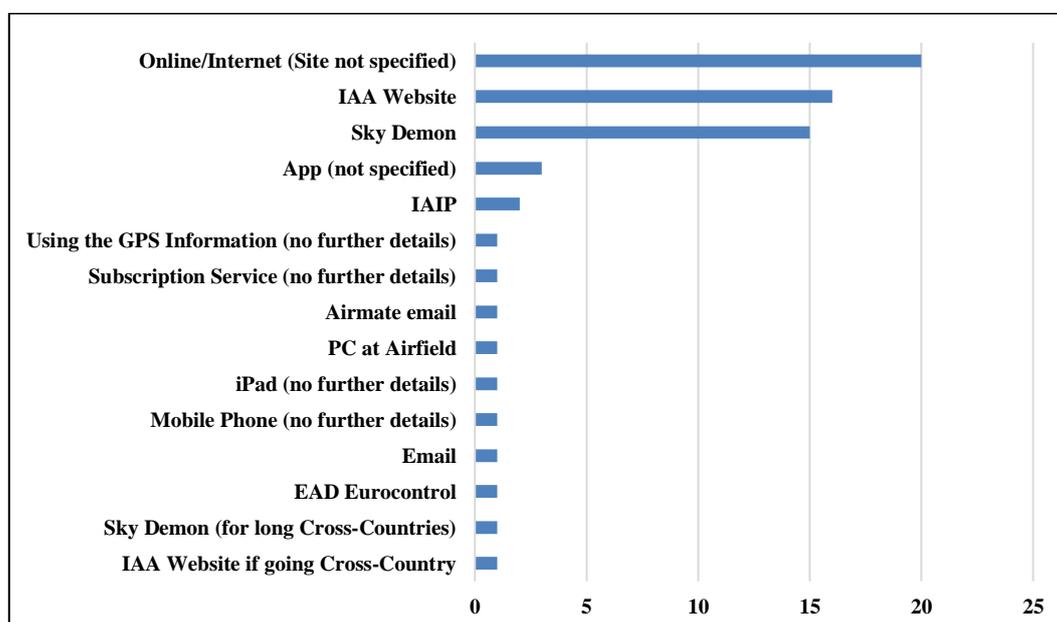


Figure 13: How NOTAMS are checked



Q19 asked “*Do you routinely check weather information and if so, how?*” All 124 respondents to this question indicated that they checked weather information before flight, with 95 (76.6%) indicating how this was done using the free-text field (Q19 How). **Figure 14** below depicts the results.

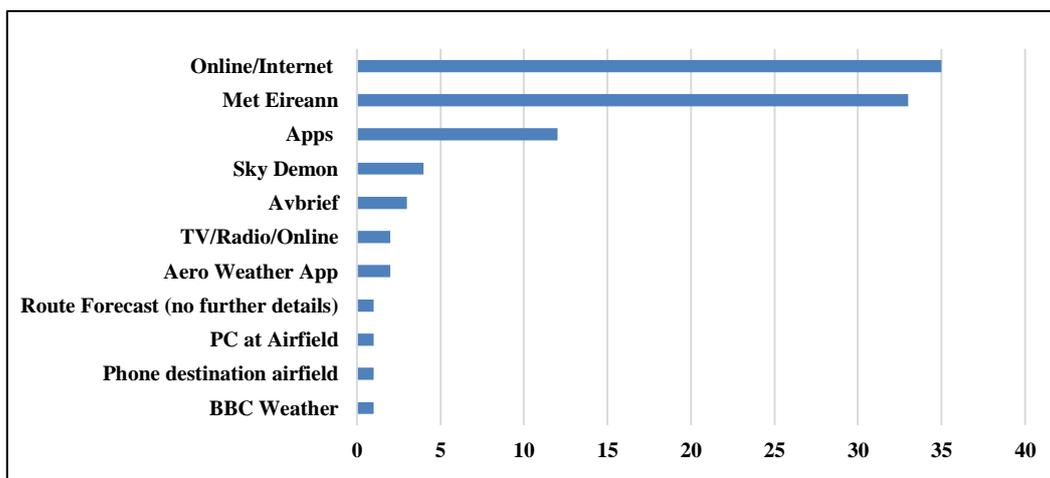


Figure 14: How weather is checked

Q20 asked “*What class of airspace do you normally operate in (tick either or both)?*” A total of 129 responses were received, with 14 respondents (10.9%) indicating they normally flew in controlled airspace, 79 in uncontrolled (61.2%), and 36 (27.9%) in both. **Figure 15** below refers.

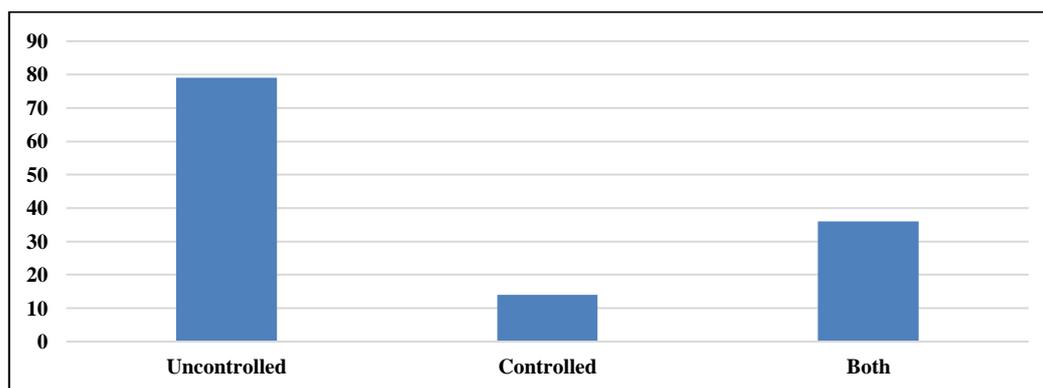


Figure 15: Class of airspace normally used

2.6 Club/Association Membership and Resources

Four questions were asked in relation to Club/Association Membership and Resources.

Q21 asked to “*Please indicate if you are a member of a flying club*”. The number of respondents who answered this question was 127, with 63 respondents indicating that they were members. The other 64 indicated that they were not.

Q22 asked to indicate “*What other flying association/societies you are a member of (if any)?*” A free-text response was required. **Figure 16** below depicts the results. Most of the 103 respondents (74) indicated that they were members of ILAS.

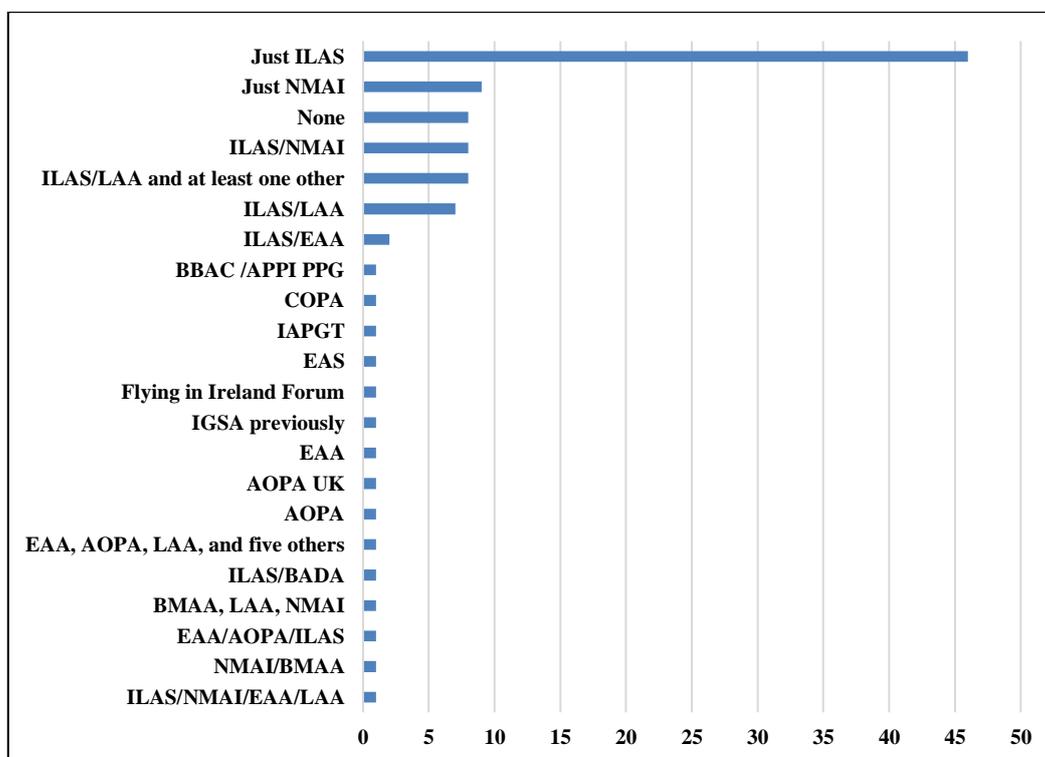


Figure 16: Membership of associations

Q23 asked “Does your association/society or flying club hold safety presentations/seminars on a regular basis (e.g. annually)?” A total of 81 of the 120 respondents (67.5%) indicated in the affirmative.

Q23A was only displayed if a respondent indicated that their association/society or flying club held safety presentations/seminars and asked “If so, how many have you attended?” Respondents were presented with three options: “Most”, “Some”, or “None”. Out of a possible 81 answers, 80 were provided. Details are included in Figure 17.

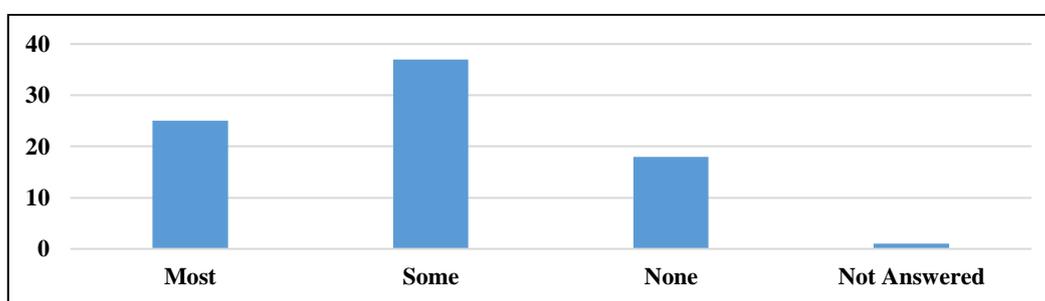


Figure 17: Attending of safety seminars

2.7 Access to Safety Information

Four questions were asked regarding Access to Safety Information.

Q24 asked “Are you on the Air Accident Investigation Unit’s (AAIU) notification email system for AAIU reports?” Only 40 of the 126 respondents (31.7%) indicated that they were. The other 86 indicated that they were not.



Q25 asked to “Please indicate if you use any of the following websites to obtain safety information”. Respondents were presented with a list of eight websites, plus a free-text “other” option. **Figure 18** below depicts the 121 responses received. Exactly 50% of the 86 respondents who indicated that they were not on the AAIU’s email notification system, indicated that they used the AAIU’s website to obtain safety information. The “other” category included websites such as: BADA, Transport Canada Aviation Safety Letter, ASN aviation safety wikibase, EAA, Curt Lewis, EGAS, EASA Skybrary, UK AAIB, GASCo, AOPA, Flight Safety Foundation, CHIRP, NMAI and Flying in Ireland. Most respondents indicated that they used several of the websites specified.

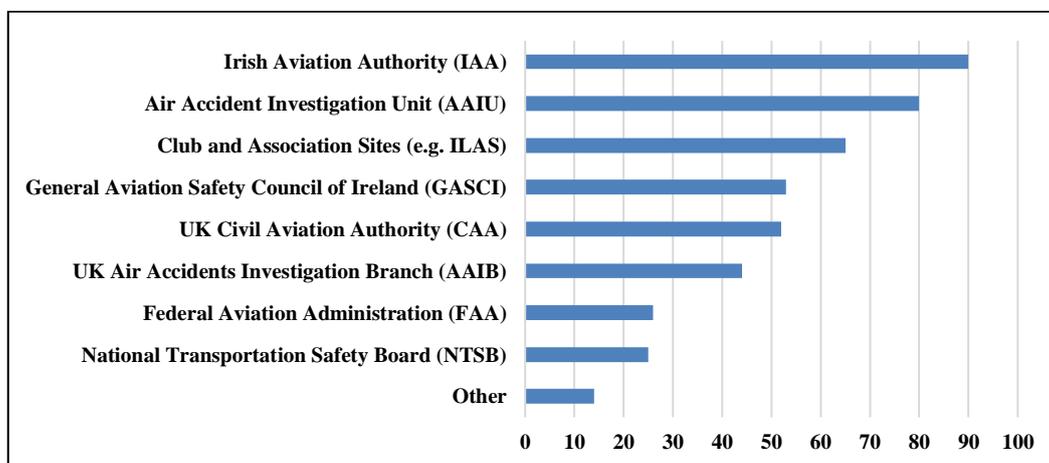


Figure 18: Websites used to obtain safety information

Q26 asked “Where else do you obtain safety information from?” A free-text response was required. Some of the 67 responses received referred to numerous sources. **Figure 19** below illustrates the results.

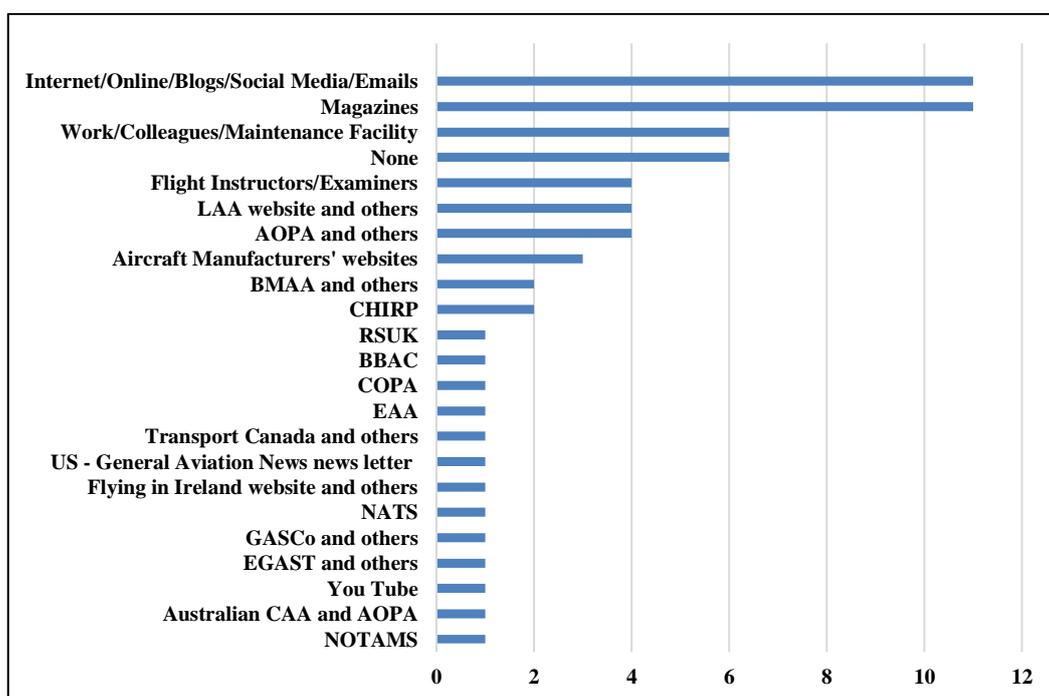


Figure 19: Other sources of safety information



Q27 also required a free-text response and asked “*What other safety information, currently not available, would be useful?*” In total, 42 responses were received. However, 10 of these indicated “N/A” or “unknown” or “nil further”. Eight themes were identified in the remaining 32 answers. The themes and some of the suggestions provided are outlined in **Table 3** below.

Table 3: Safety information currently not available that was deemed to be useful

Theme	Details
Weather-Related	“Easier access to met briefings – the current system is not user-friendly”, “In-cockpit weather information, as available in the US”. “Weather and NOTAMS flight planning, without all the password drama, would be a good start”.
Training	“Better understanding in the principles of flight in certain conditions”. “Recurrent flight training for PPLs”.
CRM and TEM	“Awareness of CRM/TEM as a major factor in GA accidents”. “Information about threat and error analysis”.
Confidential Reporting and Feedback	“Anonymous safety forum”. “Personal experiences shared anonymously of situations that could have ended badly...”.
Centralised Information and Dissemination	“Countrywide website, kept up to date with weather and field operating conditions/status, especially during planned events”. “There's a lot available out there, once one takes the time to find and read it”. “Sometimes hard-copy by post is more effective than information available but not always flagged/obvious/accessed on websites...”.
ATC	“ATC feedback re airspace incursions”. “More ATC information”.
Alerts by other Pilots	“Alerts by other pilots flying i.e. runway unusable, carb icing conditions reported in certain areas, drones spotted”.
Information on Drones	“I don't (and a lot of other pilots don't) know a whole lot about them and how they may affect flight safety”.

2.8 General Aviation Safety

Six questions were asked in relation to General Aviation Safety.

Q28 asked “*What do you think is the greatest safety concern in General Aviation in Ireland?*” A free-text response was required. Some of the 89 responses described more than one concern. Several themes were evident in the answers provided. The principal themes and some of the concerns raised are presented in **Table 4** below.

Table 4: Greatest safety concerns as described by GA pilots

Theme	Details/Concern Raised
Lack of Currency	“Lack of currency, particularly with emergencies - while not limited to owners, they are the highest risk. Many PPLs do the minimum needed to renew SEP. The only time they cover emergencies is (maybe) in the mandatory instructor flight every 2 years”. “Continued deterioration in Irish weather resulting in lack of currency for pilots”. “High cost per hour= low hours=decrease[d] skill levels”. “Due to poor weather and rising fuel cost, pilots are falling way below the required level of experience that Irish aviation demands”. “Keeping current in flying. If you are not current it could lead to making mistakes” “Not enough flying hours to maintain proficiency due to expense” “Poor weather in winter causing lack of currency”.



Training Deficiencies	<p>Continuous Flight Training: <i>“Lack of continuous training. After the PPL many people only do a flight with instructor when required for rating renewal.....also, no appetite in clubs etc. for continuous safety training or refresher training on ground school subjects e.g. Mass and Balance. Once PPL exams are done you never need to revise this stuff ever again if you don't want to”.</i></p> <p>IMC/Instrument/GPS Training: <i>“It is easy to find yourself in non-visual conditions. It would be great to get a rating like [the] UK's IMC rating as it is very relevant to our climate. I have found myself close to nasty visual situations due to the temperature dropping in the evenings during the winter”.</i></p> <p>Lack of instrument appreciation: <i>“Even if a flight is under VFR, a greater understanding of the available functionality of installed instruments can help avoid CFIT. Having confidence in and basic experience of instruments makes for safer flight and decision making”.</i> <i>“VFR to IFR and inaccessibility to a training course for same. Instrument rating seems to be too big an undertaking for most PPLs”.</i> <i>“Lack of Training in and acceptance of GPS in flying schools and training establishments”.</i></p> <p>Engine Failure Skills: <i>“Power pilots are not aware of how far their plane goes when the propeller ceases to rotate, (engine failure)”.</i> <i>“Lack of realistic engine failure training (no emphasis on the fact that idle thrust often gives a better glide ratio that [w]hen prop is wind-milling leading to many 'real' engine failure forced landings impacting short”.</i> <i>“I think it's important to complete PFL's to a height below 500ft in order for the student to appreciate aspects such as slope, surface, obstacles etc. 'Shying' away from the ground with an engine failure could be disastrous (leading to loss of control at low altitude where recovery is not possible)”.</i></p> <p>CRM and TEM Training: <i>“Lack of interest by most GA pilots in CRM and TEM awareness”.</i></p> <p>UPRT: <i>“I would like to participate in upset recovery training and I think that it would be a great benefit to all pilots. Cost is a concern”.</i> <i>“Lack of AoA awareness in flying training”.</i> <i>“Loss of Control Inflight - Stall / slow flight is always done at altitude during training. There seems to be a disconnect between some pilots' reactions (esp. students) to a stall warner at high altitude and one in the circuit for example on the base to final turn. The priority appears to be lining up with the runway rather than keeping the wing below the critical AoA”.</i></p>
Weather Issues	<p><i>“...I am aware of pilots taking on a flight when the weather conditions would dictate that staying on the ground would be the safest”.</i> <i>“People taking chances with the weather”.</i> <i>“Flying in inappropriate weather for aircraft type”.</i> <i>“Weather is a permanent risk in Ireland, promulgation of info is not the solution, APPs solve that problem....its attitude to risk”.</i> <i>“Lack of weather reading abilities leading to poor decisions”.</i> <i>“Weather. We live in Ireland – changeable” (Several comments on this theme were received).</i></p>
Poor Communication with Air Traffic Control and Airspace Awareness.	<p><i>“Avoidance of ATC services, fear of using radio particularly for those learning to fly in small GA airfields - we should introduce a formal RT training and aural test as part of the PPL as in the UK”.</i> <i>“No understanding of joining procedures or RT skills when coming into fly-ins. The unwillingness of some to use the radio, never mind a transponder”.</i> <i>“Lack of communication between aircraft in class G aerospace”.</i></p>



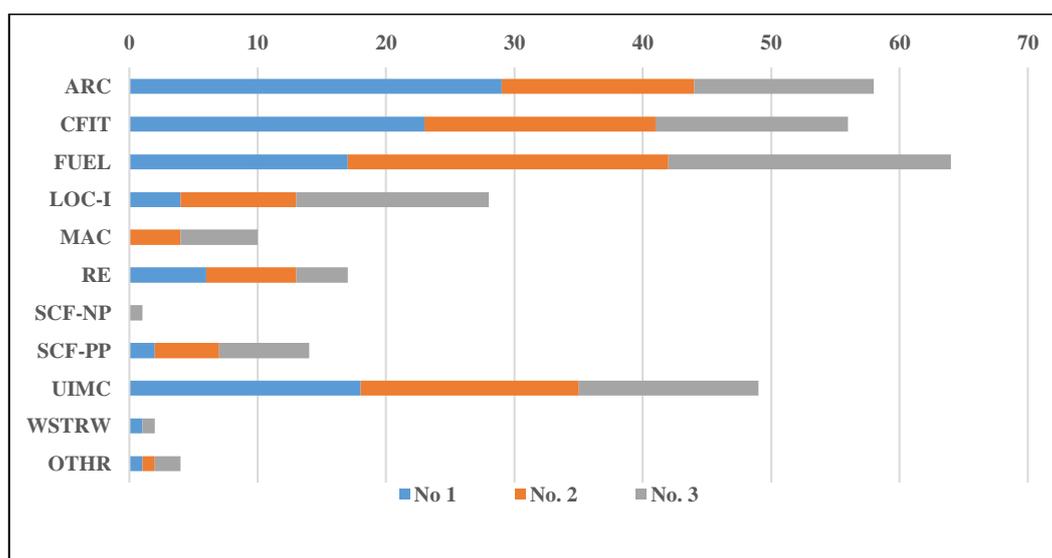
<p>Poor Communication with Air Traffic Control and Airspace Awareness (continued).</p>	<p><i>“There are a considerable number of pilots flying GA aircraft that have very poor radio proficiency. As a result they are unlikely to use a radio when flying in uncontrolled airspace and avoid controlled airspace. As a result, they are flying around without letting anybody know what they are doing or where they are going...”.</i></p>
<p>Over-Confidence and Complacency</p>	<p><i>“The complacency and unnecessary risks taken by some”.</i> <i>“Lack of practice, coupled with over confidence”.</i> <i>“Complacency. Ireland is small and people have visited nearly every airfield and think it’s just a short hop but aren’t prepared for weather or emergencies”.</i> <i>“Many PPLs take minor avoidable risks in day-to-day flying, sometimes because they have often done it before and there were no adverse consequences. The cumulative risk of more than one (even just two) minor risks can have major consequences. Example: An aeroplane can be flown close to/on c of g limits because two heavyish guys fly a marginally underpowered plane. On most days there are no obvious consequences. But add in a second risk factor that may be particular to that day such as windshear, and the situation has changed from manageable to challenging”.</i></p>
<p>Over-Reliance on Technology or Distracted by Technology</p>	<p><i>“Use of GPS, while a significant safety enhancement for situational awareness, has bred a get up and go culture without due consideration to weather and performance planning...”</i> <i>“Lack of good look out in general, a lot due to too many gadgets in the cockpit”.</i> <i>“In my opinion pilots are also placing too much reliance on GPS-based flight planning tools”.</i> <i>“Overconfidence in using GPS”.</i> <i>“The replacement of basic navigation skills with an emphasis on electronic navigation. No more than the minimum is spent on pilotage, plotting, is taught and even when it is, it’s quickly discarded in favour of GPS as soon as the ink is dry on the flight test”.</i> <i>“I’ve seen a trend in the microlight community towards using moving maps/GPS to fly in weather conditions that are totally unsuitable for VFR flight”.</i></p>
<p>Poor Flight Preparation and Planning.</p>	<p><i>“Lack of pre-flight checks and planning”.</i> <i>“Lack of use of pre-flight performance calculations”.</i> <i>“A greater emphasis on a thorough pre-flight is needed in this country”.</i></p>
<p>Use of Mogas/ Carb Icing</p>	<p><i>“Fuel tank contamination with the onset of ethanol used in unleaded fuel with aircraft using Mogas, I believe this issue will manifest itself in the accident reports over the next number of years and there has been limited discussion on this in safety publications. Many permit aircraft utilize fibreglass fuel tanks that are slowly being destroyed by ethanol and this was deemed to be the cause of an engine failure regarding a shadow aircraft in Donegal recently. Most microlight use fibreglass tanks and I do not think most owners are being guided on the serious threat the ethanol poses to fuel systems, the fuel tanks in these aircraft are often built into the structure which prevents changes”.</i> <i>“Ethanol in unleaded fuel - not knowing the percentage of ethanol in the fuel”.</i> <i>“Continued use of unleaded petrol in aircraft/engine combinations not approved/tested for the use of such, where the pilot doesn’t understand the consequences of the use of ethanol in their aircraft”.</i> <i>“Fuel quality (Mogas) is going unmonitored”.</i> <i>“Carb. Icing - the climate and the high use of Mogas in GA”.</i></p>



Regulatory/ Oversight Issues	<p><i>“Lack of oversight for light/micro class”.</i></p> <p><i>“It might benefit to have a national standard of pilot licencing and compel owners to register imported aircraft, rather than operating on foreign registrations for indefinite periods. This will allow for greater oversight of general aviation activities without creating an atmosphere of over-regulation”.</i></p> <p><i>“Lack of oversight by people with experience in the relevant area”.</i></p> <p><i>“Disconnect between NAA, AAIU and GA community”.</i></p>
Aircraft Handling	<p><i>“Pilot loss of control”.</i></p> <p><i>“...there is a similar degradation in handling skills. Cross-wind, short-field operation, etc. Both deficiencies are reflected in the frequency and pattern of accidents in Ireland”.</i></p>
RPAS/Drone Operation	<p><i>“Reckless use of drones at heights above 1,000ft or beyond line of sight”.</i></p> <p><i>“The increasing numbers of RPAS devices, although they should be registered and operated in accordance with published rules many are not registered and may be operated at heights and in areas which may be a collision hazard”.</i></p> <p><i>“Un-regulated drones operating near airfields”.</i></p> <p><i>“Increased drone use with no training”.</i></p>
Modern Aircraft Complexity	<p><i>“Complexity of modern light aircraft and microlights. Many small aircraft now contain systems which are complex and could lead to problems if not fully understood by the owner / operator”.</i></p>
Aeronautical Charts	<p><i>“Aeronautical chart updates very slow”.</i></p> <p><i>“Bad VFR maps in Ireland”.</i></p> <p><i>“High ground especially around Mayo/Sligo/Donegal – the latest aeronautical map has errors”.</i></p>
Ageing Fleet	<p><i>“Ageing fleet in C of A category”.</i></p> <p><i>“Age of fleet/equipment”.</i></p>
Airmanship/ Professionalism	<p><i>“I notice a lack of look-out by pilots when flying with companions”.</i></p> <p><i>“See and be seen”</i></p> <p><i>“Seriously (not a gripe) GA in Ireland is very loose and ragged”.</i></p>
UIMC	<p><i>“Bad Weather - inadvertent flight into IMC”.</i></p> <p><i>“VFR to IFR and inaccessibility to a training course for same”.</i></p>



Q29 asked “What do you think are the most common occurrence categories for General Aviation Accidents/Serious Incidents in Ireland?” Respondents were asked to indicate 1, 2 and 3 from a selection of CICTT¹ occurrence categories, with guidance included as appropriate. A total of 110 respondents answered this question. Five responses containing duplicate answers (more than one first, second or third choice) were excluded from the dataset, as was one completed response, which contained unusual answers, such as “21”. A number of respondents (18) went beyond what was requested by entering higher places than third; numbers higher than 3 were excluded from their responses. Three responses, each missing a first **and** a second choice **and** a third choice, were also excluded. This refinement resulted in a total of 101 valid responses (**Figure 20** refers. This figure shows the number of first choices (in blue), but also shows the effect of respondents second and third choices (in orange and grey respectively).



ARC: Abnormal Runway Contact; **CFIT:** Controlled Flight Into or Toward Terrain; **FUEL:** Fuel-related; **LOC-I:** Loss of Control – Inflight; **MAC:** Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions; **RE:** Runway Excursion; **SCF-NP:** System/Component Failure or Malfunction (Non-Powerplant); **SCF-PP:** System/Component Failure or Malfunction (Powerplant); **UIMC:** Unintended Flight in IMC; **WSTRW:** Windshear or Thunderstorm; **OTHR:** Other;

Figure 20: Perceived most common occurrence categories

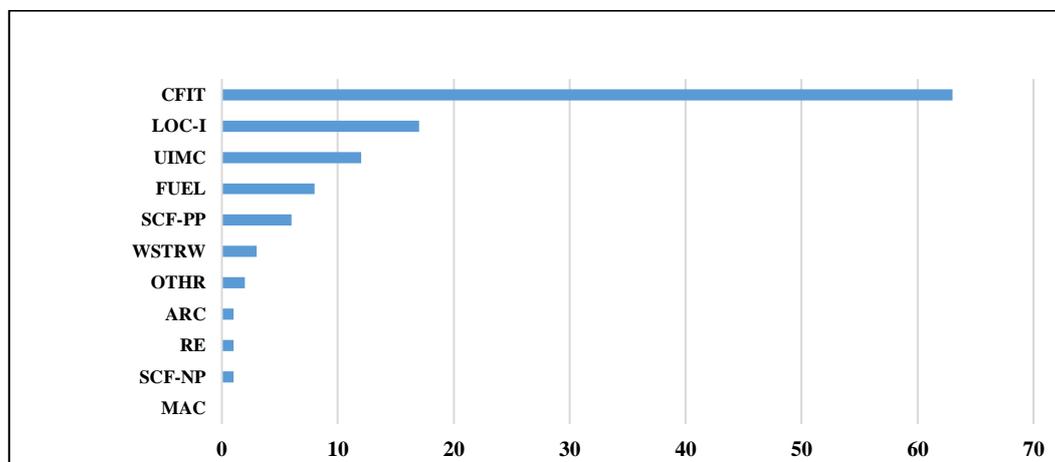
The category that was deemed by respondents to be the most common (in terms of first choices) was Abnormal Runway Contact (ARC) (e.g. hard/heavy/long/fast/bounced/gear-up landings), with 29 (28.7%) making it their first choice, followed by Controlled Flight into Terrain (23/22.8%), Unintentional Flight into IMC (UIMC) (18/17.8%), and FUEL (e.g. exhaustion/starvation/contamination/carburettor icing) (17/16.8%).

The 101 valid responses were examined to establish if there was any similarity between responses. The maximum number of respondents that ranked their categories in the same 1, 2 and 3 order was three. This occurred for three separate groups of respondents, with each of these groups choosing a different ‘top three’ (ARC 1st, CFIT 2nd, FUEL 3rd), (CFIT 1st, FUEL 2nd, ARC 3rd) and (UIMC 1st, CFIT 2nd, FUEL 3rd).

¹ **CICTT:** The ICAO/CAST (Commercial Aviation Safety Team) Common Taxonomy Team developed an occurrence categorisation taxonomy, which comprises of 38 occurrence categories. This taxonomy is widely used in the aviation industry and in associated safety publications.



Q30 also presented respondents with a selection of occurrence categories and asked “Which occurrence category do you think causes the most fatalities/injuries in Ireland?” A total of 114 responses were received. **Figure 21** below depicts the results. Entries made in the “Other” category contained the following two entries: “Powerplant failure and subsequent mishandled forced landing or stall spin etc.” and “Weather-related”. Over half of all respondents (63/55.3%) selected CFIT.



ARC: Abnormal Runway Contact; CFIT: Controlled Flight Into or Toward Terrain; FUEL: Fuel-related; LOC-I: Loss of Control – Inflight; MAC: Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions; OTHR: Other; RE: Runway Excursion; SCF-NP: System/Component Failure or Malfunction (Non-Powerplant); SCF-PP: System/Component Failure or Malfunction (Powerplant); UIMC: Unintended Flight in IMC; WSTRW: Windshear or Thunderstorm;

Figure 21: Category perceived to cause most fatalities/injuries in Ireland

Q31 asked “Have you ever had a close call when flying? (i.e. have you ever almost been involved in an accident or serious incident?)”. The number of responses received was 117, with 65 (55.6%) indicating “No” and the remainder (52) indicating “Yes”. The distribution of pilots’ age groups amongst those who responded is shown in **Figure 22**.

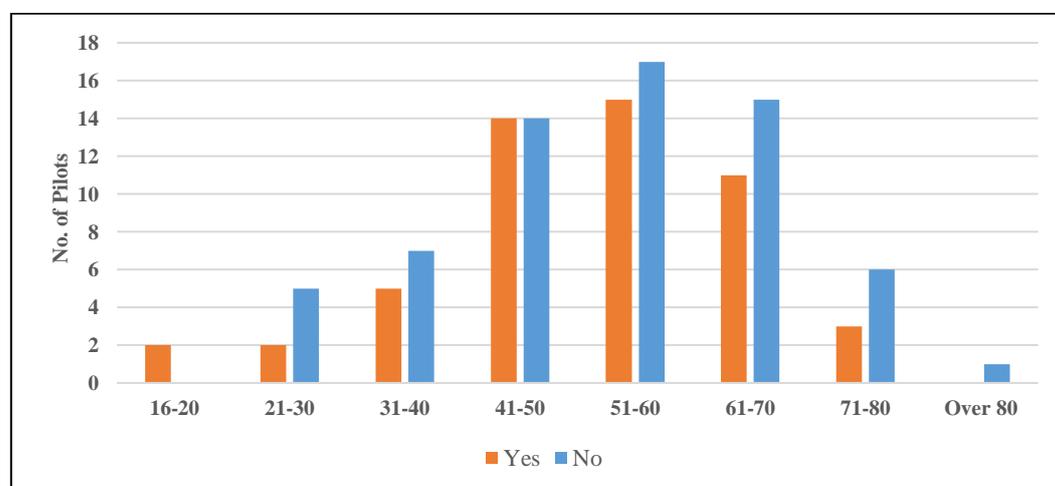
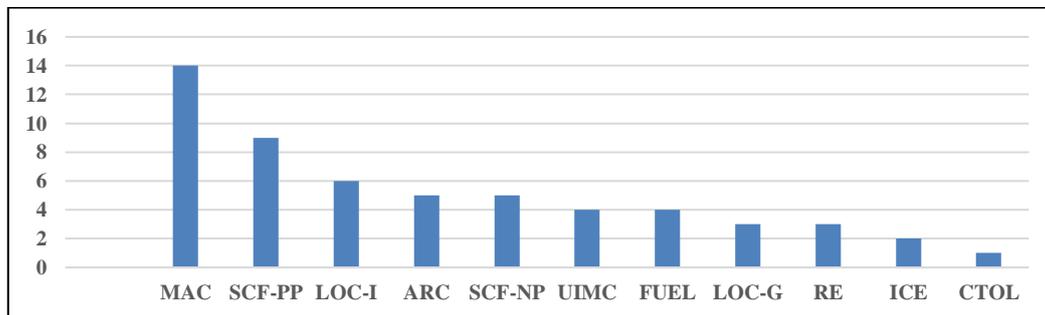


Figure 22: The incidence of “close calls” and pilots’ age groups



Q31A was only displayed if a respondent indicated that they had a close call when flying and asked “*Can you briefly describe the event in general terms?*” (using free-text). Out of a possible 52, a total of 45 provided an answer. One response was excluded as it referred to an event that occurred in another country. Five of the remaining 44 responses described more than one event. Occurrence categories were applied to the scenarios described, based on the accident/serious incident category that was avoided. **Figure 23** below illustrates the results.



ARC: Abnormal Runway Contact; **CTOL:** Collision with Obstacle(s) During Take-Off or Landing; **FUEL:** Fuel-related; **ICE:** Icing; **LOC-G:** Loss of Control – Ground; **LOC-I:** Loss of Control – Inflight; **MAC:** Airprox/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions; **RE:** Runway Excursion; **SCF-NP:** System/Component Failure or Malfunction (Non-Powerplant); **SCF-PP:** System/Component Failure or Malfunction (Powerplant); **UIMC:** Unintended Flight in IMC;

Figure 23: Near-miss occurrence categories

Q31B asked “*How was the accident/serious incident avoided?*” A free-text response was required. Eight of 42 responses received referred to “*luck*”. Ten respondents reported that mid-air collisions (MAC) were prevented by avoidance manoeuvres; four of these were initiated following what was described as “*a good look out*” or “*by being vigilant*”. Two LOC-I accidents were avoided by what was described as “*stall recovery actions*” and “*lower the nose, add power and use rudder to maintain directional control*”. Accidents were prevented following engine failure events (SCF-PP) by what was described as successful forced landings and “*taking quick action, and not hesitating*”.

Two “*FUEL*” related engine stoppages also occurred. One respondent highlighted “*regular engine out practice/glide approaches*” as being the reason that an accident did not occur. One SCF-NP event described how the aircraft’s canopy opened in flight and had to be retained by one hand, leaving only one hand available to operate the aircraft controls. The pilot closed the throttle and concentrated on operating the flight controls. An accident was avoided due to “*regular training at flying club in emergencies including glide approaches*”.

Q32 asked “*How do you think General Aviation Safety could be improved in Ireland?*” A free-text response was required. In total, 89 responses were received. One of these stated “*Yes*” and may have misunderstood the question. Several themes were identified in the remaining 88 responses. A number of respondents highlighted several ways that they thought GA safety could be improved. The principal themes identified and the number of times they were cited are outlined in **Figure 24** below. The most commonly cited suggested improvement was in the area of communication/safety promotion/information sharing, which was cited 30 times, followed by improvements to training (16 citations). Detailed extracts from the responses in relation to these two areas are contained in **Table 5** below.

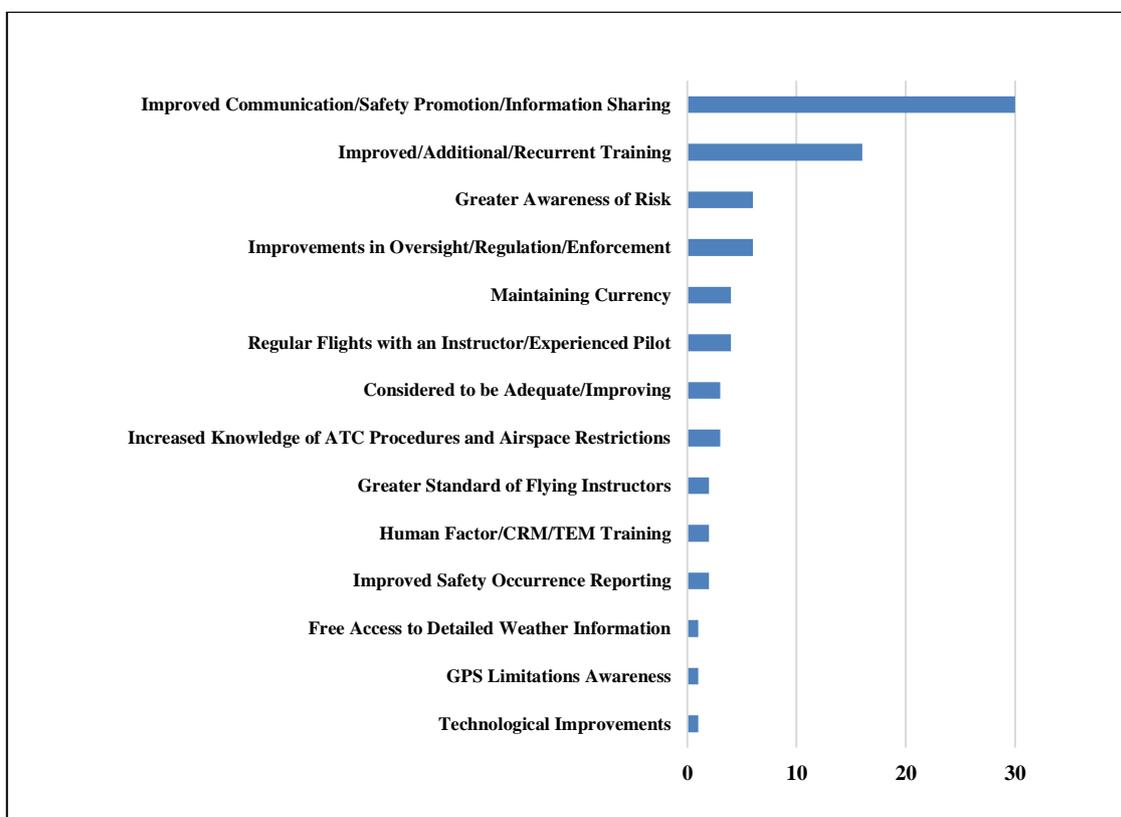


Figure 24: Suggestions as to how GA safety could be improved

Table 5: Extracts from responses to Q32

Theme	Details
Improved Communication/Safety Promotion/Information Sharing	<p><i>“Through a forum whereby other people's experiences can be shared like: ‘I learned from such and such an experience’ as used to be published in ‘Pilot’ years ago”.</i></p> <p><i>“Access to information should be free and easy to obtain”.</i></p> <p><i>“As someone new to GA there appears to be a lot of rules and regulations, the reasoning for this is mostly driven by safety but the link is not always clearly made. Engagement and safety training support to clubs, flying schools and individuals would help encourage open and honest discussion about safety”.</i></p> <p><i>“Improved access to safety information”.</i></p> <p><i>“More coaching, mentoring and safety promotion ...”</i></p> <p><i>“More emphasis on Safety seminars like the GASCI ones ...”</i></p> <p><i>“More lectures on safety. There should be safety seminars in every flying club during the winter months...6 per year and free to everyone”.</i></p> <p><i>“Dissemination of information via clubs”.</i></p> <p><i>“Communication. Also, good awareness of the need for pilots to discuss and share information...”.</i></p> <p><i>“General Aviation Safety Council of Ireland (GASCI) Meetings/ safety evenings seem to be the key to improving safety but so far I have found them practically inaccessible due to venue location...”.</i></p> <p><i>“I think there should be more safety seminars, not just by GASCI, but by the IAA etc.”.</i></p> <p><i>“Mandatory attendance at safety briefings in order to have your SEP re-validated, i.e. your logbook must be stamped when you attend briefings and this will be checked by the flight instructor”.</i></p>



Improved Communication/Safety Promotion/Information Sharing (continued)	<p><i>“More safety evenings particularly in early Spring before the light flying season”.</i></p> <p><i>“Workshops on flight safety based on the latest incidents in the GA community”.</i></p> <p><i>“Regular Regional and online seminars with pro-active inputs; self-tests etc.”.</i></p> <p><i>“Simplify all means of information into one Website, easy and free of charge to use”.</i></p> <p><i>“More GASC[I] safety meetings maybe every 6 months instead of annually, more development of GASC[I] in Ireland, more advertising to get more GA pilots attending these meetings, analysis [of] previous accidents [...] which could [have] been avoided”.</i></p> <p><i>“More safety-related content coming from the IAA.... Look at the safety materials coming from the FAA...”.</i></p> <p><i>“Occasional IAA briefings at main GA airports/airfields”.</i></p> <p><i>“More GASCI talks”.</i></p> <p><i>“There also needs to be a meaningful government strategy to promote and support General Aviation in Ireland, otherwise safety-work will just be another valuable but unconnected dot in the overall landscape of GA”.</i></p>
Improved/Additional/Recurrent Training	<p><i>“More regular mandatory required refresher checks”.</i></p> <p><i>“Overhaul of primary flight training”.</i></p> <p><i>“Pilot education is currently leading to large knowledge gaps. The gap in education, theory and application on how to conduct a flight safely and do threat and error analysis etc., between commercial and non-commercial the gap is too large”.</i></p> <p><i>“The 12-hour minimum flying time every 2 years is not adequate. Many pilots stay in the circuit or very close to base. It should be a minimum of a repeat of the qualifying cross country for the PPL test every year. It need not be more than 12 hours in total but it should include a long cross country with several away landings”.</i></p> <p><i>“Pilots who only fly from long tarmac runways need advanced handling training before attempting difficulty airfields, e.g. short, wet grass, narrow, obstacles... etc.”</i></p> <p><i>“I think some training in actual bad weather, i.e. rain, low cloud etc. might help to reduce the panic that can occur when it happens in real life”.</i></p> <p><i>“I think working towards continuing training being perceived as a ‘value-add[ed]’ to people’s flying rather than just a ‘compulsory’ item may help”.</i></p> <p><i>“More training....the UK have many safety courses about weather, sea survival etc. available. There is an AOPA wing scheme that incentivises people to do more training. We don’t have any of that here in Ireland. Once the PPL is done. There is no requirement to do anymore training or no ‘carrot’ to do more training”.</i></p>



3.0 List of Acronyms

AAIB	Air Accidents Investigation Branch
AAIU	Air Accident Investigation Unit
AOA	Angle of Attack
AOPA	Aircraft Owners and Pilots Association
APPI PPG	Association of Paragliding Pilots and Instructors – Powered Paragliding
ARC	Abnormal Runway Contact
ATC	Air Traffic Control
BADA	British Air Display Association
BBAC	British Balloon and Airship Club
BBC	British Broadcasting Corporation
BMAA	British Microlight Aircraft Association
CAA	Civil Aviation Authority
CAST	Commercial Aviation Safety Team
CICTT	ICAO/Commercial Aviation Safety Team Common Taxonomy Team
CFIT	Controlled Flight Into or toward Terrain
CHIRP	Aviation and Maritime Confidential Incident Reporting
C of A	Certificate of Airworthiness
COPA	Canadian Owners and Pilots Association
CRM	Crew Resource Management
CTOL	Collision with obstacles during Take-Off or Landing
EAA	Experimental Aircraft Association
EAD	European AIS Database
EAS	Experimental Aviation of Switzerland
EGAST	European General Aviation Safety Team
FAA	Federal Aviation Administration
GA	General Aviation
GASCI	General Aviation Safety Council of Ireland
GASCo	General Aviation Safety Council
GPS	Global Positioning System
IAA	Irish Aviation Authority
IAIP	Integrated Aeronautical Information Package
IAPGT	International Association of Professional Gyroplane Training
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules

**List of Acronyms (continued)**

IGSA	Irish Gliding and Soaring Association
ILAS	Irish Light Aircraft Society
IMC	Instrument Meteorological Conditions
LAA	Light Aircraft Association
LOC-I	Loss of Control In-flight
MAC	Mid-Air Collision
MOGAS	Motor Gasoline
NAA	National Aviation Authority
NATS	National Air Traffic Services
NMAI	National Microlight Association of Ireland
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
PC	Personal Computer
PFL	Practice Forced Landing
PPL	Private Pilot Licence
RE	Runway Excursion
RPAS	Remotely Piloted Aircraft System
RSUK	Rotorsport UK
RT	Radio Telephony
SCF-NP	System/Component Failure – Non-Powerplant
SCF-PP	System/Component Failure – Powerplant
SEP	Safety/Emergency Procedures
TEM	Threat and Error Management
UIMC	Unintended flight in IMC
UK	United Kingdom
UPRT	Upset Prevention and Recovery Training
VFR	Visual Flight Rules
WSTRW	Windshear or Thunderstorm



Appendix A Screenshots showing online survey as it was presented to participants
(Including those questions that were only asked if certain answers were given to the preceding question).

THE SAFETY OF GENERAL AVIATION IN IRELAND

INFORMATION FOR PARTICIPANTS

General Aviation
For the purpose of this research, General Aviation (GA) is considered to be “*Aviation activities that do not involve commercial gain or transporting passengers for reward*”. However, it also includes aircraft operation connected with both parachute activities and flying school activities, due to the types of aircraft used.

Background
This survey forms part of an in-depth study of GA safety and accident and serious incident causation in Ireland, undertaken as part of a Safety and Accident Investigation MSc carried out through Cranfield University in the UK. The results of the survey will be analysed in conjunction with trends obtained from a review of publicly available Air Accident Investigation Unit Reports for events which occurred over a 10-year period. The research is completely separate from the work of the Air Accident Investigation Unit.

Confidentiality
All data provided is for research purposes only. It will be treated in strict confidence and will remain anonymous.

Potential Benefits
When complete, it is intended to publish the results of the research on the General Aviation Safety Council of Ireland (GASCI) website. These results may be of benefit to the Irish GA community.

Completion Time
This survey should take no more than 15 minutes to complete.

Researcher's details
If you require any clarification or if you wish to discuss anything further, I can be contacted at j.owens@cranfield.ac.uk. Thank you. John Owens.

I confirm that I have read this information and give my consent to taking part in this research. I also confirm that I currently conduct the majority of my GA flying in Ireland.

Confirm

0% 100%



GENERAL INFORMATION

Please indicate your age:

- 16-20
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- Over 80

What type(s) of licence(s) do you hold?

- Student (No Licence Required)
- Student (SPL issued by the IAA)
- PPL
- CPL
- ATPL
- Other

Please indicate if you hold either (or both) of the following aviation qualifications:

- Instructor (FI)
- Examiner (FE)



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FLYING EXPERIENCE

Approximately how many hours have you flown in total?

Approximately how many of the total hours flown were in General Aviation?

Approximately how many General Aviation hours have you flown in the last 12 months?

On approximately how many days have you flown General Aviation Aircraft in the last 12 months?

Approximately how many landings have you performed in General Aviation Aircraft in the last 12 months?

Do you also fly commercially?

- Yes
- No



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TRAINING

How long ago was your last instructional flight? (General Aviation)

- Less than 1 year
- Between 1 and 2 years
- Over 2 years, but less than 5 years
- Over 5 years, but less than 10 years
- Over 10 years
- Over 20 years

Have you ever received any Upset Prevention & Recovery Training (UPRT)?

- Yes
- No

In terms of General Aviation, what other types of training would be of benefit to you as a pilot?



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GA AIRCRAFT INFORMATION

Please indicate the type(s) of aircraft you normally fly:

- | | |
|---|---|
| <input type="checkbox"/> Single Engine Piston | <input type="checkbox"/> Glider (Motor) |
| <input type="checkbox"/> Multiple Engine Piston | <input type="checkbox"/> Helicopter |
| <input type="checkbox"/> Microlight (3-Axis) | <input type="checkbox"/> Gyrocopter |
| <input type="checkbox"/> Microlight (Flexwing) | <input type="checkbox"/> Paramotor |
| <input type="checkbox"/> Glider (Unpowered) | <input type="checkbox"/> Other <input type="text"/> |

Is the aircraft you mostly fly operating on a Flight Permit or a Certificate of Airworthiness?

- Flight Permit
 Certificate of Airworthiness

Please indicate if you own, part-own or hire the aircraft you fly:

- Own
 Part-own/Syndicate
 Hire/Flying Club



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What country is the aircraft registered in?

- | | |
|--------------------------------------|--|
| <input type="radio"/> Ireland | <input type="radio"/> United States |
| <input type="radio"/> United Kingdom | <input type="radio"/> Other <input type="text"/> |

Where is the aircraft normally based?

- Licensed Airfield
 Unlicensed Airfield/Private Strip

Do you normally use a satellite navigation system?

- Yes
 No



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Is it your primary navigation source or is it used for situational awareness only?

- Primary Navigation Source
 Situational Awareness Only



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FLIGHT PREPARATION/AIRSPACE USED

Do you routinely check NOTAMS before flight and if so, how?

Yes

No

Do you routinely check weather information before flight and if so, how?

Yes

No

What class of airspace do you mostly operate in? (Tick either or both)

Controlled

Uncontrolled



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CLUB/ASSOCIATION MEMBERSHIP AND RESOURCES

Please indicate if you are a member of a flying club?

- Yes
- No

What other flying associations/societies are you are a member of (if any)? (e.g. ILAS)

Does your association/society or flying club hold safety presentations/seminars on a regular basis (e.g. annually)?

- Yes
- No



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How many have you attended?

- Most
- Some
- None



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ACCESS TO SAFETY INFORMATION

Are you on the Air Accident Investigation Unit's (AAIU) notification email system for AAIU reports?

- Yes
- No

Please indicate if you use any of the following websites to obtain safety information:

- | | |
|---|---|
| <input type="checkbox"/> General Aviation Safety Council of Ireland (GASCI) | <input type="checkbox"/> Air Accident Investigation Unit (AAIU) |
| <input type="checkbox"/> Club and Association Sites (e.g. ILAS) | <input type="checkbox"/> UK Air Accidents Investigation Branch (AAIB) |
| <input type="checkbox"/> Irish Aviation Authority (IAA) | <input type="checkbox"/> National Transportation Safety Board (NTSB) |
| <input type="checkbox"/> UK Civil Aviation Authority (CAA) | <input type="checkbox"/> Other <input type="text"/> |
| <input type="checkbox"/> Federal Aviation Administration (FAA) | |

Where else do you obtain safety information from?

What other safety information, currently not readily available, would be useful?



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GENERAL AVIATION SAFETY

**What do you consider to be the greatest safety concerns in General Aviation in Ireland ?
(Please also explain why)**

**What do you think are the most common occurrence categories for General Aviation
Accidents/Serious Incidents in Ireland? (Please indicate 1, 2 and 3)**

- Abnormal Runway Contact (ARC) (e.g. hard/heavy/long/fast/bounced/gear-up landings)
- Airprox/Loss of Separation/Near Mid Air Collisions/Mid Air Collisions (MAC)
- Controlled Flight Into/Toward Terrain (CFIT)
- Fuel Related (FUEL) (e.g. exhaustion/starvation/contamination/carburetor icing)
- Loss of Control–Inflight (LOC-I)
- Unintended Flight in IMC (UIMC)
- Runway Excursion (RE)
- Wind Shear or Thunderstorm (WSTRW)
- System Component Failure or Malfunction (Non-Powerplant) (SCF-NP)
- System Component Failure or Malfunction (Powerplant) (SCF-PP)
- Other (Please Specify):

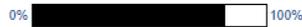


Which occurrence category do you think causes the most fatalities/injuries in Ireland? (Choose one)

- Abnormal Runway Contact (ARC)
- Airprox/Loss of Separation/Near Mid Air Collisions/Mid Air Collisions (MAC)
- Controlled Flight Into/Toward Terrain (CFIT)
- Fuel Related (FUEL)
- Loss of Control–Inflight (LOC-I)
- Unintended Flight in IMC (UIMC)
- Runway Excursion (RE)
- Wind Shear or Thunderstorm
- System Component Failure or Malfunction (Non-Powerplant) (SCF-NP)
- System Component Failure or Malfunction (Powerplant) (SCF-PP)
- Other (Please Specify):

Have you ever had a close call when flying? (i.e. have you ever almost been involved in an accident or serious incident?)

- Yes
- No



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Can you briefly describe the event in general terms?

How was the accident/serious incident avoided?



And finally, how do you think General Aviation Safety be improved in Ireland?

0%  100%

Thank you for taking the time to complete this survey.
Your response has been recorded.

0%  100%

Survey Powered By [Qualtrics](#)

Document Author: John Owens, Cranfield University, 30th October 2018

- End -



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