By Henry G. Fiorentini



# The Truth that no one talks about

The Definitive Documentation on the Magnitude and Causes of General Aviation fatalities

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### **These articles appear FAR TOO FREQUENTLY!!!!**

**Report:** Scottsdale attorney who died in plane crash not  $\leftarrow$  2015. Took his whole family to the grave certified to fly in bad weather

The Depublic Leasenford care (



A Scottsdale-based attorney was not certified to fly in inclement weather, which contributed to his small plane crashing in the mountains outside of Payson last year, killing him and his family,

The plane's co-owner, who did have an IFR rating, reviewed the flight plan and the forecast weather two days before the crash. He informed the pilot he should make the eight-hour drive since <u>the weather would not allow for a visual flight rules flight.</u>

"However, the pilot elected to proceed with the flight contrary to the co-owner's recommendation," investigators wrote. "The pilot entered the flight route into the Foreflight mobile application but did not receive any weather briefings from flight service or the mobile application before departure."

with him

### FLORIDA AUTOPSY NOTES DRUGS IN ROY HALLADAY CRASH

Baseball great Roy Halladay had morphine, amphetamine, an antidepressant, and prescription sleep aid Ambien (zolpidem) in his system when he died in the November 7, 2017, crash of an Icon A5 in Florida, an autopsy showed. -aopa.org



← And the scud-running, non-instrument pilot who crashed after bypassing VFR skies nearby because he didn't want to get stuck there if the weather didn't improve. Very pretty family, but they're all dead, too.

As a sage observer said :

"They were dead long before they hit the ground – they just didn't realize it...)

### Denial says "Oh, this can't happen to me." Reality says "Oh yes, it can..



# Introduction

### The desired 'take aways' from this Paper are:

- The FIRST STEP in fixing any problem is to HONESTLY CONFRONT the problem.
- Once and for all, a single, easy-to-find, impossible-to-deny source that FLYING GA IS 8x RISKIER THAN DRIVING. (Page 3)
  - Personal Recreational flying is most of that (Page 9)
- A LARGE percent of pilot fatalities are just a failure to use BASIC common sense and skills nothing sophisticated. (Page 10). It is easy to be safe! But it is easier to be careless.
- Recognizing 'Cognitive Dissonance' to perhaps 'Catch yourself doing it, before it's too late'.
- Suggested recommendations to the GA Leadership and the Rank-and-File.

**Why Pilots Die**: Why would anyone want to read about *that*? Because:

#### "Those who don't learn from History's mistakes are destined to repeat them<sup>1</sup>"

The initial motivation for this White Paper is **John King's** groundbreaking interview titled "<u>The Big Lie</u>" published in the March 2001 issue of **Flying** magazine .

He lays the crux of GA's steadfast and egregious fatality numbers at the feet of:

Until we stop lying to ourselves and face some hard facts, we'll keep making the same mistakes and dying because of it.



John points out that when he and Martha go to rent horses for a 1 hr trail ride on flat farmland, he signs a 3-page waiver indemnifying the stables from all injury, including death. "If I can admit that I can die falling off a lazy 10 yr. old horse, how can I deny that catapulting though the air at 200 mph, a mile over the Earth is 'safe'???" he effectively asks, and he is spot on.

Below are the salient statements that John makes:

- Flying is <u>not</u> safe.
- But we have told ourselves "The Big Lie" so often that we believe this lie.
- Pilot "attitude" is one of the biggest risk factors involved.

This paper substantiates those claims both quantitatively and qualitatively to put to rest the falsehoods that block the road to pilot safety, and adds recommendations on how to get there.

<sup>&</sup>lt;sup>1</sup> George Santayana

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NOTE: If you want a paper copy but don't have a color laser printer, you can get the PDF printed at many Staples or Office Depot stores, but they're expensive (\$14+). So I'm investigating low volume 'at-cost' printing from Amazon, which will be about \$8. <u>Contact me</u> if interested.

Rev: 12/15/20

## **Section I Analysis of Crashes**

### Here's a spoiler alert for those don't like reading:

- Risk:
  - Flying GA is about **8x MORE RISKY** than driving your car.

← BAD NEWS.

I regret that finding accurate, cited information on basic accident data was almost impossible. What *was* found in abundance was flagrant hearsay of people quoting stats with authority and yet <u>absolutely no citation</u> to validate such. So the basic stats provided here included hyperlinks (click on them in the PDF) to take you to the government website as the source of this data. The full URL (website) is spelled out in full, in the appendix.

Many will attempt to 'quibble' about safety stats, but the actual statistics are so blatant as to evoke the old adage: "You don't:

- Measure with a micrometer, then
  - Mark with a crayon, to finally
    - $\circ$  Cut with a chainsaw".

The point here as that <u>the data is so overwhelmingly blatant</u> (like 'factors of 8x to 16x', not mere 20% or even 100% but up to 1,000%) that there is no room for micro-quibbling of the data.

### • Reasons:

• Many GA accidents are **highly avoidable**:

### ← GOOD NEWS

~ 33% can be fairly labeled as "Academically Avoidable",

as in "What the heck was that pilot thinking??!!!! "

~ 12% are 'simple' stalls: Too Steep, too Slow – basic, very basic, Stick-N-Rudder skills

I reviewed each of the 203 fatal accidents from the NTSB website for 2015 (latest available), as shown on p 7-8. About a full THIRD are just careless, irresponsible (aka 'stupid') acts that no amount of 'training' can change. You can't possibly warn people about every form of stupidity like:

### "Do *NOT* leave your engine running unattended to keep the mosquitoes away while you pack." "Do *NOT* fly at treetop level while simultaneously taking pictures of your friends' wedding."

which are just some of the deaths that comprise the 33%. These are in addition to the common fatal mistakes like not checking fuel, shooting approaches below minimums and other things that you can't "teach". Genius has limits, stupidity does not. These are the largest, single chunk of fatalities.

Additionally, about 12% were simple, basic – but fatal – stalls. Relatively plain old "Too steep of a climb, too sharp of a bank, too little power". Basic pilot skill, missed by *experienced* pilots.

These are subjective categories added to the official NTSB report. You are encouraged to download, review and 'grade' these for yourself (at <u>www.lsFlyingSafe.com</u>).

A word about the word 'Stupid'. While used frequently herein, the proper term would be 'grossly careless and irresponsible, to the point of recklessness'. Regrettably, that correct term is too long to use in all the places it applies. And while 'stupid' carries an insulting overtone, it is arguably about as respectful as many of these acts deserve, regrettably.

The point is not to belittle the dead, but to benefit the living.

### A) The overall risk (fatalities) of GA

Because of the blatant hearsay and misinformation described at the beginning of this section, the following table is drawn directly from the government websites which are cited (and hyperlinked so you can click and see the raw data for yourself), namely the NHTSA (National Highway Traffic Safety Administration) and the BTS (Bureau of Transportation Statistics). Casual comparison of the BTS and NTSB/FAA websites show consistent figures, so it is not clear who is the 'official librarian' of the aviation numbers but to the extent that they are all in agreement, the distinction is moot.

Driving statistics are from <u>National Highway Traffic Safety Admin (page 31)</u> Flying statistics are from <u>Bureau of Transportation Statistics</u> (page 31)

As a <u>reference point</u> (page 32 ), in the U.S. there are :

- There are ~224,000 GA planes, 200 Million passenger vehicles and 8 Million motorcycles.
- The 224,000 planes are comprised of 140k SE Piston, 16k Twin, 9k Turbo Props, 12k Turbo jets, 10k Helicopters, 25k Experimental and 13k 'Other'.
- In 2017 there were 162k Private pilots, 6.1k Sport (only) pilots, and 149k Students..
   In 2015 there were 171k Private pilots, 5.5 Sport (only) pilots, and 123k Student Pilots.
   In 2010 there were 202k Private pilots, 3.2k Sport (only) pilots, and 119k Student Pilots.
   From the appendix, there is about a 15% decrease in Private pilots in the last 5 years.

All following data is for the latest year available, which is 2015. If you are comfortable reading tables, you can just skip to the next page.

Looking at **Driving** stats there were about 35,100 deaths with an estimated total of about 3.10 Trillion miles driven. Dividing 35.1 thousand by 3.1 trillion, you get a rate of **11.3** deaths per Billion miles

We now seek out the same fatality rate for **Flying** (GA, not commercial) aircraft. The metric for planes however is 'hours flown' not 'miles traveled', so we select a credible conversion factor.

#### For **2015**, there were **376** deaths with an estimated **20.6** million hours flown.

So, who do you convert to 'MILES flown' from 'HOURS flown'? Easy: 'Miles Per Hour' The speed of most GA planes is between about 100 to 200 miles per hour (87-174Kts), so viewing this in the light most favorable to flying safety we seek to make the denominator (miles) as large as possible to make the overall ratio (death rate) as small as possible, so we choose 200 mph.

20.6 Million hours converts to 4.12 Billion <u>miles</u> as the denominator for **458** deaths which is a rate of **92** deaths per Billion miles.

This ratio (92/11.3) is 8.12, which is to say

### "Flying has over 8x as many fatalities as driving"

Using 100 mph would result in 16x more fatalities as driving, as pilots would accumulate fewer miles for their logged hours which makes the 'deaths/mile' ratio even higher.

#### In Table Form:

	FATAL	.IT\	/ DATA					
		ī						
Per	mile		Per Vehicle					
DRIVING								
Deaths	35,100		35,100	Deaths				
Miles	3,100,000,000,000		200,000,000	Vehicles				
= Deaths/Mile	11.3 / Billion		<b>0.175</b> / 1,000	= Deaths/Vehicle				
				-				
FLYING (G/A)								
Deaths	376		376	Deaths				
Hours	20,600,000		224,000	Planes				
@ 200 mph	X 200							
Miles	4,120,000,000							
= Deaths/Mile	92 / Billion		<b>1.68 /</b> 1,000	= Deaths/Plane				
		-		-				
Flying vs	<mark>92 / 11.3</mark>		<b>1.68 / 0.175</b>	Flying vs				
Driving	= 8.1		= 9.6	Driving				

Note: Government websites typically use a denominator of 'per 100 Million miles' (10<sup>8</sup>) instead of a Billion (10<sup>9</sup>) used above, so "11.3 deaths per Billion" becomes "1.13 per 100 Million" in their terminology.

Per the Appendix, 2015 figures show that motorcycles have a fatality rate of 253 per Billion miles (vs the 92 at 200 mph, 184 at 100mph) which is 1.4x to 2.7x (let's call it an even 2x) that of GA flying, depending which of the two "Miles Per Hr" conversion rates used for flying. So, it is credible to say that motorcycle riding is slightly riskier (about 2x) than flying.

Per vehicle, there were 35.1k deaths per 200M passenger vehicles= 0.175/k, versus 376 deaths per 224k GA planes =1.68/k, which is almost 10x higher than passenger vehicles. And most everyone agrees that planes spend more time in hangars than do cars in the garage.

#### If you want to use 'hours spent in the vehicle' as a metric:

**Flying** fatalities are 376 per 20.6 million hrs. which is a ratio of **18.3 deaths per Million Hours**. To have the same ratio for driving, the **35,100** driving deaths would have to occur in 1.9 billion hours. To cover **3.1 trillion miles** in only 1.9 billion hours requires an average speed of 1,600 mph. So flying is *as safe* as driving, only if you use 1,600 mph as the conversion factor from miles driven to hours driven.

The slower the mph rate you use, the more hours it takes to accumulate 3 Trillion mile which makes the 'deaths per hour' even lower, making driving look even safer 'per hour'. Using 50 mph (average Hwy and City), it would take 60 Billion hrs. to drive 3 Trillion miles. As a rate, that's 35k/60B = 0.58 M deaths per Million Hours driving. 18.3 divided by 0.58 is 32x.

Filtering for just **'Passenger Car miles'**, the government "Quick Facts" in Section V shows that the 'just passenger cars' ratio is 8.9/B (=0.87/100M) deaths per mile vs the 11.13/B overall in 2015, which is slightly safer than the overall fatality ratio for all highway vehicles.

And just think about this in simple, back-of-the-envelope terms: There are about 100x as many total driving fatalities as there are in GA flying accidents, and your gut just has to tell you that there are far more than 100x as many cars and drivers out there as there are us little guys in our airplanes.

Or, if you prefer 'per person', there are 376 deaths amongst about 170k Private pilots (2.2 per thousand), whereas there are about 35k auto deaths amongst about 222 million drivers (0.16 per thousand). So again, there is no metric by which flying is even remotely as safe as driving a car.

To be fair, cars are VERY safe, so this is setting the bar very high. But recall that the point is to dismiss the fallacy that driving – safe as it is – is *worse* than flying. To be fair to pilots, riding a bicycle on a city street is arguably riskier than driving in a car too – but a different paper!

On a related topic, almost 60% of the aircraft identified on the NTSB spread sheet in the next section are 'Part 23, Certified' aircraft.

So per the adage of "Don't bother to measure with a micrometer if you're cutting with a chainsaw", while one may quibble with specific values in the numerator and denominator of these fatality figures, it is clear that even changes of 20% or 50% (or even 200% (2x)) are insignificant when the final ratios are up in the 8x range.

John King, AOPA, NAFI<sup>2</sup> and the others in the aviation community are correct to say that

"We have a big problem with pilot fatalities",

and this paper's intent is to undermine those who say

"No, we're fine. We're even safer than driving!"

So let me be clear on this:

The point is NOT to show that flying is X.XX % riskier than driving, but only to remove the falsehood that "Flying is safer than even driving a car" which is used as an excuse to not confront the seriousness of fatalities in the GA community.

By the way, I contacted a Senior Editor at AOPA and asked if AOPA had many any formal statement on the relative risk of flying versus driving, and the reply was:

"I haven't found any policy statements to that effect."

Before leaving this section, let's address any so-called 'improved safety trend'. As shown on the following tables and graphs, there is at best a minute downward trend in accidents and fatalities, especially when you consider the relatively small sample size (vs something like automobiles) that naturally lends itself to 'leaps and lurches' with small data sets, but you can also show that serious injuries are UP! Let's learn how to not be fooled by cherry-picked data.

<sup>&</sup>lt;sup>2</sup> National Association of Flight Instructors

### Is our safety record improving?

First a word about '**standard deviation'**, which is very important in any statistical analysis. In simple terms, it is the 'spread' or 'volatility' or 'inconsistency' of the data stream. In slightly mathematical terms, it is the 'average distance of each data point from the overall average'<sup>3</sup>

Is that signif	ficant?? M	aybe not! C	Consider the	e following 2	2 data sets:			
	1	2	3	4	5	6	AVG	Std Dev
Series 1	10	10	10	10	10	11	10.2	0.3
Series 2	5	15	1	19	10	11	10.2	5.5

For any string of data, someone might say "there's a 10% jump this year!" Is that significant?? Maybe not! Consider the following 2 data sets:

**There is a "10% jump!" for both series** in year 6 (up from 10, to 11) in both cases. Both series even have the same average! But as you can see by inspection, an increase of 1 is very significant in Series 1, but it is 'lost in the middle' of Series 2. "On average", data points are very close together in series 1, but about 5 apart in Series 2, even though both have the same average.

So be careful when being given just a minute, incremental piece of statistical information as it is often misleading – especially if the author has a motivation to spin/promote a certain viewpoint. Always try to get 'the big picture', or at least ask for the 'spread' (which is a less nerdy way of asking for the standard deviation or mean deviation).

Ok, with that bit of academia under our belt, let's turn to the actual data. As cited in the appendix, we pull our data from

0	United States Department of Tra	insportat	tion										
1	Table 2-14: U.S. General Aviation <sup>a</sup> Safety Data												
2	2010 (R) 2011 (R) 2012 2013 (R) 2014 (P) 2015												
3	Total fatalities	458	458	438	391	424	376						
4	Total seriously injured persons	256	328	247	(R) 215	234	248						
5	Total accidents <sup>a,b</sup>	1,440	1,471	1,473	1,224	1,223	1,209						
6	Total accidents <sup>a,b</sup> , fatal	271	270	273	222	257	229						
7	Flight hours (thousands)	21,688	U	20,881	19,492	19,617	20,576						
8	Rates per 100,000 flight hours <sup>c</sup>												
9	Fatalities	2.11	U	2.10	2.01	2.16	1.83						
10	Seriously injured persons	1.18	U	1.18	(R) 1.10	1.19	1.21						
11	Total accidents <sup>a,b</sup>	6.64	U	7.05	6.28	6.23	5.88						
12	Total accidents. fatal <sup>a,b</sup> ∢	1 25	U	1 31	1 14	1 31	1 11						

https://www.bts.gov/content/us-general-aviationa-safety-data

The Standard Deviation for Fatalities is 0.13, so anything between 1.9 and 2.2 is 'within one standard deviation' and so not a particularly big change from the norm. So 1.83 *is* a slightly notable improvement for the most recent year available!

<sup>&</sup>lt;sup>3</sup> Technically that is the Mean Deviation, where as the Standard Deviation is the square root of the square of each of the differences. The difference is subtle, but standard deviation accentuates 'outliers' more than the mean deviation. Amazingly, there are readers who actually will point this out to me if I didn't include it!

But on the other hand, "Seriously Injured persons" have a Standard Deviation of 0.04, and they are WAY UP from the average- in both absolute terms and relative to Std Deviation.

Putting that in graph form for the visually preferred:



So, if you want to imply that "Fatalities are going down this year" (which they are, ever so slightly but arguably immaterially), then you can use the raw fatality figure (which incorrectly but subtly omits the decrease in flying activity which

accounts for the fewer accidents because people aren't flying as much in the first place), and/or just 'cherry pick' the data to find the spots that support your data withOUT showing the big picture.

On the other hand, it is equally true that "Serious Injuries" are <u>going up</u> in the same time period!

From the Appendix, and one of the many places that the NTSB makes this data available (late-breaking data for 2016 added):



So like I said up front, you don't:

- "Measure with a micrometer, then
  - Mark with a crayon, to finally
    - $\circ$   $\;$  Cut with a chainsaw".

Compared to 800 % more fatalities than driving, a '5-10% improvement' is nothing to brag about. Such small changes man not be even statistically significant, relative to normal 'jitter' in the data.

Anecdotal: Boating is almost impossible to compare to flying, given the nature of the activity, but here's a few numbers for <u>comparison</u>. In 2015, about 74 million people engaged in boating, with <u>626</u> <u>deaths</u>. So while there are <u>2x as many deaths in boating</u> as flying, there were also 370x (74M/200k) as many people out on the water doing the activity.

In the next Section 1B, we look at the breakdown of where these fatalities are coming from and see if we can find a pattern that emerges that can lead us to a solution - or at least a sizeable reduction once we can find the source.

The source is <u>www.NTSB.Gov</u> the NTSB (National Transportation Safety Board) that is the government agency charged with investigating and reporting on accidents.

Fortunately, most of the data we want is found in one Excel spreadsheet. I had to hunt down an auxiliary 'information text' file and merge it into the final sheet used for this analysis, but you can just grab my final Workbook of Spreadsheets from <u>www.lsFlyingSafe.com</u>, or the raw NTSB data at <u>https://www.ntsb.gov/investigations/data/Pages/AviationDataStats2015.aspx</u> **2015** is the most recent data available.

First, we enumerate the values for a few of the major categories (which are the columns of the spreadsheet). Besides some of the obvious ones like 'NTSB Event ID#', Date, Airport, City, State, etc. are some major 'explanation' categories:

<b>EVENTS</b>			
AMAN	Abrupt Maneuver	MAC	Mid-Air collision
ARC	Abnormal Rwy Contact	OTHR	Other
BIRD	Bird Strike	RAMP	Ramp
CABIN	Cabin Related	RE	Runway Excursion
CFIT	Controlled Flight into Terrain	SCF-NP	System/Comp Failure - Non Powerplant
CTOL	Collision during Takeoff or Landing	SCF-PP	System/Comp Failure – Power Plant
EVAC	Evacuation	SEC	Security
F-NI	Fire Non Impact	TURB	Turbulence
FUEL	Fuel	UIMC	Unintended flight into IMC
GCOL	Ground Collision	UNK	Unknown
ICE	Ice	USOS	Under/Over Shoot
LALT	Low Alt	WSTRW	Wind Shear or Thunderstorm
LOC-G	Loss of Control - Ground		
LOC-I	Loss of Control - InFlight		

PHASE			
STD	STANDING	APR	APPROACH
PBT	PUSHBACK/TOWING	LDG	LANDING
ТХІ	ΤΑΧΙ	EMG	EMERGENCY DESCENT
TOF	TAKEOFF	UND	UNCONTROLLED DESCENT
ICL	INITIAL CLIMB	PIM	POST-IMPACT
ENR	EN ROUTE	UNK	UNKNOWN
MNV	MANEUVERING		

Common 'Parts':

- 23 Certified aircraft (as opposed to Experimental)
- 91 Small, non-commercial aircraft within the U.S.
- 135 "On-Demand" air carriers (charters)
- 121 Commercial air carrier (the airlines)

First, we look at the "Defining Events" of the Accidents. The NTSB categorizes each of their Accidents into Fatal or Non-Fatal.



"Powerplant System Malfunction" (aka "Engine problems") are the #1 cause of ALL accidents, but they account for only 14% of all fatalities. Looking at the graph, we see that the events that have the highest fatality rate when they <u>do</u> happen are UIMC (Unintended Flight into IMC, aka VFR into IMC) and CFIT (Controlled Flight Into Terrain). But the biggest killer is LOC-I (Loss of Control Inflight)

Note that the NTSB calls these 'Defining Events', not 'Causes'. This akin to defining deaths by "Stroke", "Heart Attack", etc., but not going back one extra step to identify the cause as cigarette smoking. This is what is called the 'proximate cause' in legal circles – the event that likely *caused* the subsequent events. Fuel fatalities have few causes other than the obvious, but LOC-I is effectively a catch all. They can only assign one code to each accident, but the WPD spreadsheet allows us to check off or 'tag' a few additional columns, to possibly get a better insight into what initiated or caused this crash. For example, a recent non-fatal crash occurred when the pilot got distracted and attempted to close a rear window, which was categorized as LOC-I even though 'pilot distraction' is what more accurately *caused* the near-fatal accident, but there is no official code for that. We seek causes and Events like LOC-I are *consequences*, not proximate *causes*.

Looking at one more standard NTSB graph, the 'phase of flight' that the Events occurred in, we find no surprises. It's close 4-way tie for first place between "En Route", "Maneuvering", "Initial Climb" and "Approach"



**Excel Spreadsheets**: People either love the or hate them. But they have unparalleled power, flexibility, ease of use and integration. **You are encouraged to grab this Excel workbook yourself from <u>www.IsFlyingSafe.com</u> Call it "The Fiorentini Report".** 

	NTOD	C							NTSB							Avoida	ble	VF	R into	IMC / I	CE / Nig	Iht	Linl	c to full
	ID#	Ľ	Deat	ns				C	EVENT" ategory	,					Mechanic	al		Fuel		7/	St	all	NTSE	B Report
		B		Ġ	i 🗍	к	LŰM	N		Р	QR	S	Î	U	V	× ×	Ý	Z	AA	AB	AC	AD A		AF
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202	ERA15FA351	9/11/15	1	1 5	SU 091	No	PERS	Persona	UNK	ENR		0 VMC	Recipr	CESSNA	172		3	3			Synopsis	NC	N The nonce	rtificated pilot's
203	ERA16LA028	10/26/15	3	3 [	DE 091	No	PERS	#N/A	WSTRW	ENR	#N/A	#N/A	#N/A	#N/A	#N/A					1	Synopsis		In additio	, there were act
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205	ERA16LA008	10/10/15	1	1 5	su 091	No	PERS	Persona	WSTRW	MNV	MANEUVE	RIN VMC	Recipr	CESSNA	172S						Synopsis		The airp	e's encounter v
206	Count:	203	357	#										Manufac	turer	45	76	j 13	39	32	2			
207														23	BEECH									
208	PURPOSE		1		FAF	Part :	EVENT	CATEGOR	Y		Condition	ns		46	CESSNA	22%	37%	6%	19%	16%				
209	Aerial Applica	6	5			91 191	Loss of C	Co LOC-I	88	43	<b>%</b> ∨	MC 1	27	5	CIRRUS DESIG	G	2.4	L L		13	Turn			
210	Air Race/Shov	2	2		1	37 6	System/	C SCF-PP	28	14	%	MC	31	3	MOONEY		Average			11	Climb		~ 2-4 sente	ence
211	Banner Tow	1			1	35 4	Controll	ecCFIT	20	10	%			40	Piper					8	X other	Su	immary fr	om full
212	Business	6	5		Tota	al 201	Uninten	deUIMC	12	6	% Engine			43	#N/A								NTSB Rep	port
213	Flight Test	3					Fuel	FUEL	8	4	% Reciproca	ting 1	37	160	SubTot									
214														43	Other/Misc									

Along the bottom are various Tally/SubTotals that I added in the WPD copy, for additional illumination of the data.

Note: "MFR" in column 'U' is almost always a 'name brand' aircraft, indicating that 'home builts' are excluded from this NTSB report. A few notes. First, it is VERY powerful that Column AB (2<sup>nd</sup> column after Z) is the Synopsis column, which is a hyperlink directly back to the NTSB page that shows the official, full (typically 1 page) write up of the incident. And even more convenient is that the (usually 1-3 sentence) summary conclusion from that Synopsis has been copied to column AE, saving you the trouble of having to leave the spreadsheet.

A few simple Excel tally/counts:

- 357 people died in 203 incidents (Row 206, Colum B and C).
- Of the 203 incidents, 127 were in VMC, and only 31 occurred in IMC. The others were 'unspecified'
- 81% were from Personal Flight, 6% from Instructional, and 8% from Business flights (10% 'other')
- Note that per the following page on 'Normalization', summaries such as Mfr are interesting but not meaningful, other than to note that almost all (160 of 203) were identified as Part 23 Certified aircraft.

208	PURPOSE		
209	Aerial Applica	6	3%
210	Air Race/Show	4	2%
211	Banner Tow	1	1%
212	Business	6	3%
213	Flight Test	3	2%
214	Glider Tow	1	1%
215	Instructional	11	6%
216	Other Work U	2	1%
217	Personal	160	81%
218	Positioning	1	1%
219	Public Aircraf	1	1%
220	SkyDiving	1	1%
221	(BLANK)	5	3%

The WPD spreadsheet is mostly the original NTSB spreadsheet with a few extra columns and subtotals added. For insight, I inserted columns X-AB to add additional quantifiable notes on each row (fatality). Call it "The Fiorentini Report<sup>4</sup>".

Mechanical: With 45 rows tagged as "Mechanical, not much the pilot could have done." that's about **22%** of the 203 incidents where it is assumed that no amount of pilot skill might have prevented. Lose an aileron cable, or suffer an in-flight structural failure and fatality is

						_
х	Y	Z	AA	AB	AC	1
						2
Mecha	A-Avoid	Fuel	VII/I/N	Stall	Synopsis	Ł
					<u>Synopsis</u>	
	3				<u>Synopsis</u>	1
					<u>Synopsis</u>	
45	76	13	39	32		1
					1	
22%	37%	6%	19%	16%	1	
					1	)
	4%	1		13	T urn	
	13%	2		11	C limb	
	20%	3		8	X other	
~~~~		-		~ ~	-	4

very likely. You might argue that a pilot should be able to land safely even if they throw a rod or seize their engine, but I erred on the side of viewing the data in the <u>best light</u> <u>favorable to the pilot</u> so that the value assigned to "non-mechanical, must be pilot error" and "Academically Avoidable" has little room to be excused as 'blaming the pilot for everything'. **This review is not meant to criticize the dead, but to benefit the living**.

<u>A-Avoid:</u> This is the Academically-Avoidable, "Was the pilot even paying attention?" or "Could these lives have been saved it the pilot just did a 'stop and think'" for the most egregious, thoughtless errors. A '3' was such an error, and trying to be fair I assigned values of 1 and 2 for "Well, I see how that *might* not be so obvious." But most were a 3 (average of 2.5). I tagged 76 of the 203 rows with a value other than zero, which accounted for **37%** of the fatal crashes. For conversation sake and to 'even out' the 'well, some were a 1 or a 2...' I'll use 33% as a number that falls into this category. And feel free to download the Excel Spreadsheet and <u>apply your own evaluations</u>.

- **Fuel:** How many were simply not ensuring that you had unpolluted (water) fuel going to the engine? From 'hangar talk gossip', I was expecting this number to be much higher than the **6%**
- <u>VII/I/N</u>: Many will state that flying into Icing or Night is equivalent to IMC, even if the NTSB didn't put it in the UIMC category. So I added a category to tally the events that seemed to fall into that category even if the NTSB sometimes categorized it elsewhere. It was **19%** of the rows.
- Stalls: Many were the summaries that described "insufficient power." and/or "angle of attack" that basically smack of "too little power for too high of a pitch or bank", so I added a column for that, and attempted to break those down into stalls during a Climb, Turn, or X other. About 12% of the fatalities involved such, pretty much evenly divided between C, T and X.

The first point I want to make is to repeat

"Don't measure with a micrometer, then mark with a crayon, and cut with a chainsaw"

These subjective tallies from the 2015 NTSB database are just that and nothing more than "Subjective Tallies for 2015", though a clear pattern seems to emerge.

<sup>&</sup>lt;sup>4</sup> An obvious attempt to compare with the AOPA Nall Report (next page)

### **GENERAL OBSERVATIONS ON 'STATISTICS':**

I warn the reader about some of the most egregious – and common – errors I find by layman who suddenly start citing statistics with little-to-no understanding of some of the most basic requirements of statistical analysis Two things: "Normalization" and "Correlation vs Causality"

#### Normalization:

Did you know that over 2x as many people died in Cessnas than did my beloved Bonanza? It's true! It's also misleading, since there are over 2x as many Cessnas out there as Bonanzas. And far more people die of heart attacks in Texas than Vermont – so move to Vermont? No. Almost nobody lives in Vermont (well, relative to Texas) so relatively few people die in Vermont to begin with, but the 'ratio' of 'deaths per 1,000 residents' is about the same in both States. This is Normalization. Be it 'per capita (person)' or 'per square mile' or whatever the appropriate denominator is, TOTALs are often meaningless and more often misleading. It is the 'ratio' or 'density' that you almost always need to be looking at. So if someone tells you that 'most pilot deaths happen to pilots with under 450 hrs.' the first thing you need to ask is 'well, isn't it possible that most pilots that are still flying (vs gave it up as they got older, poorer, whatever) are also under 450 hrs. to begin with?', as the first statistic is totally meaningless (and therefore misleading) without the answer to the second question. It's as misleading as saying that rock climbers (like mountain climbing but without safety ropes) in their 40s and 50s have fewer accidents than those in their 20s and 30s - and omitting the fact that almost no one over 45 still does rock climbing. Or, that people become better swimmers past 60 because most drownings happen at a younger age.

#### Correlation vs Causality:

Ok, this one is trickier to explain but arguably even more important.

"Correlation" is like "Coincidence", "Causality" is like "Cause"

Per capita, more people die of pulmonary (lung/breathing) disorders in Arizona than any other State in the US. This is true, not a 'trick' like the above Texas heart attacks.

The warm, dry climate in Arizona makes it an IDEAL place to live if you have respiratory problems – so LOTS of people who do have respiratory problems move there for exactly that reason. But they do eventually die (albeit at an older age) of their illness. So there is NO <u>CAUSAL</u> REALTIONSHIP between the Arizona climate and respiratory illness (living in Arizona did not *cause* their illness), but there IS A VERLY LARGE CORRELATION between living in Arizona and dying of respiratory illness. Or, even per capita, there are more Nobel prize winners in the Boston area than any other city in the U.S., making for a very high, normalized correlation between geography and Nobel Prizes. But the reason for the correlation is because Harvard and MIT are located just outside of Boston. So while there is a high correlation with getting a Nobel prize to each of living in Boston and going to Harvard or MIT, there is only a causal relationship with my having gone to MIT, not living in Boston. Which is to say that while there is a high correlation between living in Boston and get a Nobel Prize, the mere act of moving to Boston will not help cause you to get a Nobel prize.

To revisit the above drop off in pilot fatalities after 450 hrs., it is quite possible that some pilots are just irresponsible 'waiting for an accident to happen' and "Even if you *want* to keep playing Russian Roulette<sup>5</sup>, you eventually will *stop* playing - because you died..." so the drop off may equally well be related to a 'thinning of the gene pool by Natural Selection' rather than accumulation of experience. So logging 451 hrs. is of no more benefit that moving to Boston. Correlation doesn't equal causality.

<sup>&</sup>lt;sup>5</sup> Possibly a metaphor of my generation: Putting only 1 bullet in a 6-chamber hand gun and seeing if you get killed by the '1 in 6' chance when you pull the trigger. It sounds less morbid if you already understand the metaphor.

### The AOPA Nall Report

This is AOPA's summary of the NTSB data. Per emails with AOPA, the Nall report is also drawn primarily from the same NTSB data described (and downloadable) above.

# Once again, the overwhelming cause of accidents is pilot error, which has persistently caused 75% of accidents for decades.

That stubborn statistic should motivate our efforts. It means that if we influence pilots to modify their **behavior** we can drive further reductions in the number of accidents, the overall accident rate, and the number of fatalities. We in aviation should see the intransigence of the pilot-related mishap percentage as a "call to

Richard G. McSpadden, Jr. Executive Director, AOPA Air Safety Institute



#### As a bit of a recap:

arms." Safe flying,

From the NTSB website's pie chart shown at right, ALMOST ALL of the fatalities (94%) come from 'us little guys' in GA, not even Air Taxis or Commuters.

And per the inset on page 9, 81% of the fatal events were from Personal flights, only 3% from Business.

And per the "Good News" on page 1, many of them are avoidable. "Behavior" and "Attitude" seem to be the key.

A note about ADM (Aeronautical Decision Making) which is the

formal term for these 'Pilot Error Events', a term which I am very reticent to use for these basic, careless errors. ADM implies that a willful decision was made wherein many of these cases they just

weren't thinking at all. So 'ADM' seems a bit too formal and misses the point for many of these careless, almost thoughtless actions. Maybe the FAA doesn't want to use the phrase 'poor judgment' or 'carelessness' but such does seem appropriate, even if offensive. The graph at right is a subjective summary of aviation safety.

#### Flying can be safe, but not if you are careless.

One hypothesis is that a significant portion of us Recreational Pilots view flying as little more than a fun, aerial version of boating or snowmobiling – with about as little expectation of the need for training or vigilance. If true, that is a significant insight as to 'where the fatalities are coming from', which is the first step in fixing a problem -



identifying its source. This is not to say that such represents <u>the</u> source of fatalities but merely <u>a</u> source, and each source likely needs a different solution. More on this in Section IV



### **Section II - Psychological Analysis of Decision Making**

John King said that:

### Pilot "attitude" is one of the biggest risk factors involved.

As stated previously, perhaps one of the biggest problems to improving Pilot Fatality is:

### "Pilot's don't want to talk about it!"

There is a very strong resemblance to our problem 40+ years ago when people said (and believed) that:

- Cigarettes don't cause cancer.
- Seat belts are dangerous.

Especially if you were a smoker, you were NOT about to admit that "Yes, if I get sick from cancer and die, it's my own fault". So you sought out (even if only fabricated hearsay) that "Smoking does NOT cause cancer". And invariably, deep-down even got yourself to believe it.

Similarly, as a child in the '60s and '70s I remember all too well that not only were seat belts only an 'extra, expensive option', but Detroit fought tooth-and-nail to avoid legislation to have them be mandatory. Having to be 'belted in' implied that cars were not already safe and *could* kill you, and why would you want to buy from a company that implied that their product could kill you?

I remember quite a number of adults at that time (either because they identified with 'The American Automobile Industry', or they were too fat to comfortably use the belts) saying that

"Seat belts are dangerous! They could kill you!

If you ever do get in an accident, you want to be thrown clear, not trapped inside!". They never stopped to think that in order to be 'thrown clear', you'd most likely have to go head first through the windshield, but arguing with those people is like the adage: "Don't teach a pig to sing; it wastes your time, and it annoys the pig<sup>6</sup>". Denial comes in all forms.

Sadly – and this one should really scare you – a neighbor/judge had the unpleasant duty of overseeing the case where the father failed to belt his 8 yr. old son into the back seat of the car (illegal by then), who was thrown out of car and killed when the door opened going around a corner. "Well, at least all of your other children will be buckled in from now on..." my Judge friend attempted to console the father. "No", came the reply "if it's your time to go, it's your time to go..." Ech! But I wonder how many pilots effectively have a similar, fatalistic attitude? Scary...

The similarities with getting the GA community to embrace safety by first recognizing the risks are scary. But we came around to a responsible way of seeing cigarette smoking and seat belts, so we should be able to do the same with aviation safety.

<sup>&</sup>lt;sup>6</sup> Robert Heinlein

# Section II - Psychological Analysis of Decision Making 2A) Science and Theory

We're going to introduce a few standard psychology terms just to put down a few landmarks for reference, and to highlight that what pilots are going through are typical, mental processes that everyone goes through. And therefore this insight into the overall decision-making process can improve our Aeronautical Decision Making (ADM) process.

- **Cognitive dissonance** is the mental discomfort (psychological stress) experienced by a person who simultaneously holds two or more contradictory beliefs, ideas, or values.
- **Confirmation bias** is the tendency to search for, interpret, favor, and recall information in a way that confirms one's preexisting beliefs or hypotheses. It is a type of cognitive bias and a systematic error of inductive reasoning. People display this bias when they gather or remember information selectively, or when they interpret it in a biased way.
- **Motivated reasoning** is the complementary tendency to scrutinize ideas more carefully if we don't like them than if we do. The opposite of Confirmation bias, it could be called **Rejection bias**.

From the <u>page of Samuel McNerney</u> who writes for Scientific American So what's the difference between **cognitive dissonance**, **confirmation** bias, and motivated reasoning (**rejection** bias)? The short answer is that there really isn't any. Generally speaking, they serve the same purpose, which is to frame the world so it makes sense to us.

One more: **Normalcy Bias**, or **normality bias**, is a belief people hold when facing a disaster. It causes people to underestimate both the likelihood of a disaster and its possible effects, because <u>people believe that things will always function the way things normally have</u> functioned. *About 70% of people reportedly display normalcy bias* in disasters.[1]

I'm going to simplify this for our purposes to lumping this under the umbrella term of : **"Cognitive Dissonance"** - The aversion of the brain to deal with contradicting, simultaneous thoughts in your head. The result is that the brain tends to avoid the discomfort of disparity by 'fudging' one of the two conflicting thoughts to bring it into congruence with the other.

<u>Background for Cognitive Dissonance</u>: The brain does 'feel pain', but not the way you're used to: You know what a head ache is. Not a 'headache' but a 'head ache'. Does your brain ever hurt? Not the throbbing of your forehead that you take Excedrin or Advil or Tylenol for but the 'unpleasantness' of being frustrated, unhappy, angry or mad. Think about it: when you are in a 'bad mood', you are in some sort of discomfort. But it is not the kind of overt discomfort that you would call 'pain' in the more bodily sense of the word that you can put your finger on. Your brain does not have nerve sensors for things like that. But you know when you are happy, and it makes you feel good – the thought of a warm summer evening maybe with your family or others brings a sub-conscious smile to your face, and you 'feel good' without even realizing it, right?

And that door swings the other way when you are scolded by your wife, fired from your job, or told you are wrong about (oh, just about anything, probably!). THAT is the 'can't quite put my finger on it, but yeah I feel some kind of 'discomfort'..." point that is the guts of this

# Section II - Psychological Analysis of Decision Making 2A) Science and Theory

section, because it is that subconscious, almost undetectable force that can lead us to make wrong decisions that can cost us our lives.

Neurologists have terms like "Endorphins", "Dopamine", "Oxytocin" and "Serotonin" to describe what I will call the 'happy juice' that floats around in the brain. Cocaine and other narcotics release these good chemicals into your brain so you feel GREAT, which is why people like them. On the other hand, ANTI-depressants are in a category called SSRIs (Selective Serotonin Reuptake Inhibiters) which is kind of a double-negative to describe a drug that inhibits the Serotonin 'happy juice' from running away from your brain. The purpose in making this biological point is to illustrate that there is a mechanical process happening in your brain as you make decisions. Your brain is secreting, absorbing and otherwise transitioning between these chemicals which very subtly are affecting your decision-making process.

#### To simplify: "Most people avoid bad news"

So much so that noted social scientist Dr. Norman Vincent Peale made famous the line:

#### "Most people would rather DIE from FALSE PRAISE, rather than be SAVED by HONEST CRITICISM" <sup>7</sup>

This is a consequence of Cognitive Dissonance: The brain naturally wants to protect itself against feeling bad, the same way your hand automatically pulls itself away from a hot stove to avoid pain. And being told "You are wrong" is not something you want to hear, even if you are saying it to yourself and no one hears it out loud. To summarize:

We sometimes make bad decisions because we are guided by the 'path of least resistance' of pleasure/pain, and seek the choice that 'feels good'. You lie to yourself to avoid pain.

Dismissing the risks of flying makes you feel better, but Recognizing the risks of flying makes you live longer.



<sup>&</sup>lt;sup>7</sup> In his case he was merely speaking philosophically. In our case, Dying is literal.

# Section II - Psychological Analysis of Decision Making 2B) In Practice

Let's show light-hearted examples to make a point, then summarize.

On the TV show Frasier, his Dad is gobbling another donut for breakfast, and complaining "<u>That</u> <u>stupid dryer shrunk another pair of pants</u>!", refusing to deal with the fact that he's getting

fat from eating too much. "Dad" Frasier responds, "have you tried stepping on the scale?" to which his Dad doubles down to avoid the unpleasant conflict by confirming his position with "What's the use? That thing has been off by 10 lbs. for weeks now!"

Or from the old "<u>Dick Van Dyke Show</u>" where Rob is trying to make a point with his hot-headed, temperamental boss, Alan Brady:

**Rob**: "You are a very difficult and demanding man to work for." **Alan**: "Your time is up! Get out of here!

**Rob**:"But, eh, that's what make you the <u>*qenius*</u> that you are." **Alan:** "Well, ... go ahead and finish your thought..."



What is a goat doing in a cloud bank?<sup>8</sup>

#### Ego:

The ego stroking that we all do. It makes us feel good. We seek gratification, we avoid conflict. "What's the harm?" nothing if it's confined as known 'locker room banter', and deadly if you let your ego stroking work it's way into the cockpit and your ADM (Aeronautical Decision Making). "Why do people come go bars".

#### Excuses:

John King attempts rather lamely (sorry, John) to excuse pilot behavior on the 'barnstorming mentality' that is our heritage, which is ridiculous. I doubt that even *one* of last year's fatalities could be traced to the legacy and heritage of the (dead) pilot who doesn't know anything about their 'barnstorming heritage'.

#### Habit / Reinforcement:

This is **Normalcy** Bias, described above. We as humans are creatures of habit. What has happened to us previously has a disproportionate influence on us as how we behave in the future. If you ever got sick on a bad bowl of chili for example, you will probably be more leery ordering chili in the future more so than any other menu item even if the odds are/were just as likely that your illness could have come from any menu item. It's a conditioned response, it's called a Pavlovian response in psychology circles.

This works in both directions.

"That won't happen to ME" is a common feeling, and in large part because "It never happened to me before".

True:

Death doesn't usually come knocking twice; Death usually gets what it came for the first time.

<sup>&</sup>lt;sup>8</sup> Gary Larson, The Far Side

# Section II - Psychological Analysis of Decision Making 2B) In Practice

That's why the inside cover not only shows 'dead pilots and their family', but also crashed airplanes: People may be in total denial that they would ever harm their family, but crashing is something that at least enters the realm of possibility.

#### **Reinforcement / Russian Roulette:**

Personally, I think this is one of the worst causes of our outrageously high fatality rate. Someone once said

#### "Good Luck makes for Bad Habits"9

If you do something stupid and get away with it, you tend to reinforce that *bad choice* as a *good thing* – because it turned out well this time. And we encourage it. If a person does something risky with a bad result, we say "*Well, that was just stupid*!". <u>BUT</u>! If the he succeeds, our assessment suddenly flips 180 degrees to "*What a guy*!".

It turns my stomach, but I see pilots and even aviation publications do this far too often – even if only repeating such irresponsible behavior with a 'wink and a nod'. Have you ever seen yourself or cronies give an implicit 'whatta guy!' to risky behavior that happened to end up well? In one story, a commercial pilot flying 8 passengers in a twin Cessna had a nose gear extension failure. Ok, not the end of the world. People land gear up safely all the time and with 2 mains that likely just means a lot of scraped nose belly skin and a pair of bent props for the insurance company to pay for, along with the paperwork. Everyone buckles up, braces and lands, right? NOPE! This reckless pilot actually had all of his passengers UN-buckle and crawl into the cargo section in the rear of the plane to turn it into a tail dragger (obviously well outside of the POH W/B envelope) so that he could land nose up without damaging his precious props, or filing paperwork. Every pilot knows that the most important piece of safety equipment in your airplane is your lap/shoulder belt in the possible event of an emergency. Yet here we have an *actual* emergency and the pilot is demanding that the passengers give up their seat belt! . But – at the risk of other people's lives – he pulls it off, and then brags that he's done "something no one else has ever done!" And since he got away with it the aviation community pats him on the back with a big 'Atta Boy!'.

What <u>was</u> likely to happen is that this self-anointed test pilot stalls, porpoises or ground loops, killing all the occupants in a fiery crash or just kills them from blunt head trauma since **a human skull that hits anything at 40+ mph splatters like a ripe cantaloupe.** That is what most likely should have happened and then (and only then, apparently), people will say "Well that was stupid!", in addition to likely charges of Reckless Homicide<sup>10</sup> But if the pilot pulls it off, *it's* "What a great pilot!".

"Stupid is as stupid does

– and playing Russian Roulette is stupid whether you win or lose"

I find it sickening, but the aviation community actually gave this guy an 'atta boy' for this stunt <u>https://www.aopa.org/news-and-media/all-news/2013/october/pilot/never-again-the-no-nose-landing</u>

<sup>&</sup>lt;sup>9</sup> Or if no one else claims it, I will...

<sup>&</sup>lt;sup>10</sup> Reckless homicide is a <u>crime</u> in which the perpetrator was aware that their act (or <u>failure to act</u> when there is a legal <u>duty</u> to act) creates significant risk of death or grievous bodily harm in the victim, but ignores the risk and continues to act (or fail to act), and a human death results.<sup>[11]</sup> It is contrasted with <u>negligent homicide</u>, in which the perpetrator did not have the awareness of the risk, but should have had it.[1]  $\leftarrow$  These are hyperlinks in the PDF

# Section II - Psychological Analysis of Decision Making 2B) In Practice

And you wonder why we pilots die at an alarming rate?

Because we do care about <u>saving time<sup>11</sup></u>, <u>saving money<sup>12</sup></u>, & <u>showing off</u> but we don't *really* care about lives.

Be it some stupid justification like:

- "God is watching over me...<sup>13</sup>" or a fatalistic
- "When your number is up, there's nothing you can do about it..." or a naïve
- "If I don't think about it, it's not really a risk..." attitude,

we don't take this seriously -we just talk about it to make us THINK we're taking it seriously.

And none of this 'psychological insight' is intended for one moment to excuse bad behavior, but only to help identify it before it gets too far along.

Ultimately,

- 'The buck stops here<sup>14</sup>'
- "The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft<sup>15</sup>".

It's not the controller's fault, it's not the lineman's fault, it's not the autopilot's fault, it's not your partner's fault, <u>it's your fault</u>



<sup>&</sup>lt;sup>11</sup> Need anyone be reminded of what "Gotta-get-there-itis" is ??

<sup>&</sup>lt;sup>12</sup> Need anyone be reminded of pilots who run out of gas on the way to their home airport where they get cheaper fuel ?

<sup>&</sup>lt;sup>13</sup> There is no religion (including my Christian faith) that says "God will step in at random times and defy the laws of physics, just as a favor for you". People seek an excuse to avoid saying "I was just damn lucky *this time*" Attributing it to God alludes to an almost-untouchable partnership with the Almighty, whereas 'dumb luck' highlights their own failings. <sup>14</sup> President Harry S. Truman

<sup>&</sup>lt;sup>15</sup> FAR 91.3 For Commercial Pilots, the equivalent is FAR 121.533(d)(e)

# Section III– Confronting the GA Community DRAFT Overview

**On a scale of 1 – 10** with 1 being a new student and 10 being highly proficient, **many of the deaths are in the 0-2 range.** Not even 4 or 5. So per the adage "Don't measure with a micrometer if you're cutting with a chainsaw", quit wasting time doing fancy statistics or 'refining pilot skills' when the problem lies in the <u>basics</u>. **The target audience of this section is that "0-2" group**. It is hypothesized that a significant portion of fatalities come from recreational pilots who *want* to be responsible, but just haven't quite gotten there (possibly because like the 'drinking and driving' of the '70s, 'responsible' is not yet the norm) or who shouldn't be pilots in the first place because they're just looking for an aerial version of motorboating or snowmobiling. It is just that section of fatalities that is addressed in this Section. Other causes have other solutions.

Cute phrases like "Learn from other people's mistakes 'cause you don't have time to make them all yourself" are witty, but they don't seem to sink in. Neither have any of the ADM seminars, training programs or Wings courses. Our death rate remains as unchanging as the Arizona Salt Flats.



So my complaint with the status quo is, to quote Dr Phil, **"How's that been working for ya?"** Answer: <u>It hasn't.</u>

I submit that there is a path to reducing about 30-40% of the fatalities, however unpalatable this solution may be. Effectively, the GA leadership has been wasting their time by 'digging the same hole' of more seminars, webinars and training courses to people that aren't listening. By analogy, if

sinners aren't coming to church in the first place, then adding more confessionals isn't going to help. Neither is adding another ADM seminar, as the problem seems to be the pilots who aren't paying any attention in the first place. Yet another ADM seminar is arguably the epitome of "Preaching to the choir"

Looking at the data in Section 1B, there are some harsh realities that must be faced.

Roughly 33% were 'Academically Avoidable" and about 16% were Stalls (Basic Stick-N-Rudder skills). That's almost 50% right there. This is not an 'enhanced training' issue, this is just fundamentals.

Sadly, the biggest chunk (**33%**) lies is from basic *irresponsibility*. Filtering out irresponsible candidates in the first place as described in Section 3A would help, as might the 'peer pressure' described in the following section 3B, but 'yet another webinar' is unlikely to do so. In fact, all these extra courses, seminars and lecture may be counter-productive as the only good is arguably 'preaching to the choir' but are detrimental as they create a diversion from the real area of need.

A word about the 'harshness' of this paper. It has been suggested that I "soften the tone" to be more palatable. "Being nice" has not worked for 20 years, so to use one more Dr. Phil analogy:

"If the problem is that YOU'RE FAT because YOU EAT TOO MUCH.

I can't be nice and sugar-coat the message, because you'd probably eat that too!"

Read "My brother the alcoholic' on page 26. Brutal honesty is the first step in fixing a chronic problem.

### "While most anyone COULD become a pilot not everyone SHOULD become a pilot."

Do we really believe that the same level of competence, maturity and diligence that it takes to drive a motorboat can pilot an airplane? It seems that way. Being honest about the risks is like heresy.

I'm not overplaying the risks, being inflammatory or dramatic – I'm just laying out the facts with honest simplicity and accuracy. Yet the resentment I've received against promoting this paper is akin to tobacco executives saying:

### "You can't tell people about the risks of smoking – or they won't buy our cigarettes"

If John King had one point it was this: **FLYING** *IS* **RISKY!** If we don't point that out up front then arguably, we are guilty of error by omission! Arguably it is **OUR FAULT** for over selling the fun and under-representing the responsibilities.

Playing Devil's Advocate on behalf of a careless, deceased pilot for a moment:

"*It's not my fault*! Sure, it's obvious now that I'm *dead*, but at the time is seemed as safe as joy riding in a car - or as smoking was in the '50s. No one told me about 'risks and dangers'. If they talked about safety at all, it was only that *flying was <u>safer</u>* than driving to the airport! I was lied to – even if only by blatant omission – so you can't blame me for 'not knowing'."

They have a point, and maybe many of the '33%' that are labeled 'stupid' are merely 'misled'

Many people have already told me:

# "If you publish this, a lot of potential pilots are going to turn around and walk right out the door that they just came in through! "

My response is <u>**GOOD!</u>** Because if someone is not willing to make a commitment of being a responsible pilot who confronts and accepts the risks of flying, we shouldn't WANT them to be pilots – for their sake, and ours.</u>

It's like John's horse riding analogy:

"If a rider doesn't want to accept the risks and sign the waiver, the stable rightly doesn't *want* them to ride."

Why should we be any different????

In a <u>"Simpsons" clip</u>, Marge is struggling to make house sales as a Real Estate agent and defends her

slow start to her boss by saying

"You know our slogan: The right house, <u>for the right person</u>!". To which her boss confides "Marge, I'm going to let you in on a trade secret: The right house is the one for sale, and <u>the right person - IS ANYBODY</u>!".



Are we that different????

From a marketing prospective, this might work very much IN our favor by self-selecting out the careless people, but attracting those who want to be part of an elite "not just anyone" club.

### **Implementation:**

The following should be part of every introduction to flying:

FLYING	2-question personality quiz
<u></u>	About YOU:
is not for everyone.	On a scale of "+3" to "-3", with +3 being Thrill Seeker and -3 Responsible,
Flying can be the most <b>exciting</b> , liberating and rewarding experience of your life!	where would people rate you?
Dut it takes constant diligence and responsibility.	About your Interest in Flying:
Being safe is easy, but being careless is easier.	Which best describes your expectations of flying:
Even a simple error like running out of gas can	5) Carefree, just hop into a plane and enjoy the sky!
have grave consequences.	4) Somewhere between 3 & 5
Being a responsible pilot is a constant challenge.	3) I'm willing to accept some responsibility and
Can you accept that challenge?	effort, but I mostly want to have fun.
	2) Somewhere between 1 & 2.
Most anyone can be a pilot, but	1) I enjoy the benefits that go with the challenges
not everyone <i>should be</i> a pilot.	and the responsibility of flying.
If you expect all "fun & games", don't be a pilot.	Adding up your two answers, the lower your score
The NTSB has enough work to do.	the more likely you are to be a safe pilot.

Back in the early '80s when 'quit smoking' was still an uphill battle, a Dr. friend told me that the following, simple conversation had a significant impact on getting people to stop smoking:

- Doctor : So tell me Bob, do you still smoke?
- Bob : Uh, yeah. Why?
- Doctor : No reason, just asking...

The mere recognition of the fact that smoking was 'an issue', versus the tacit endorsement that "there's nothing worth mentioning" alone made a difference. So even just posting the "Flying isn't for everyone" handbill (above, full page in Section 6 and on the website), and maybe including it in the back of the 'Welcome Packet' along with rental fees, cancellation notice policy, etc. could similarly make a very easy and yet very significant impact. It explicitly and subtly addresses the risk issue, but not in a way that is confrontational, nor sugar coats it to the point of being ineffectual. By not even confronting the fact that "Flying can be (therefore 'is') RISKY", we are implicitly implying the opposite. You can print out the handbill on your printer and put it in a professional looking acrylic frame from Amazon for \$3. Do it.

Let's do a little role playing. Here are 3 scenarios that an instructor may find themselves in

# 1) A CFI has a client who agrees that learning to manage risk is an important part of learning to fly. What curriculum does the CFI use to teach risk management?

On a proficiency scale of 1-10 (1 being student, 10 being very proficient), the biggest mission of this work is to focus on the easily avoidable mistakes/stupidity that fall in the "0-2" range, not even the 4, 5, or 6+ range. So the fact that the client is aware and accepting of the risks puts them way ahead of the pack. But consider this:

Bob, we can never cover ALL the scenarios you will encounter, but whenever you have a decision to make just ask yourself this simple question:

If I do this and it goes <u>badly</u>, will people say

"Well, that was just stupid, and you should have known better!" or can YOU defend your actions and say "No, even though it turned out badly, I still think that it was a responsible choice at the

time, and I would have done the same thing even if an FAA examiner were with me."

If you can say that, then while you won't always be perfect you will rarely be irresponsible. Additionally, the CFI could concoct 'What if...' scenarios to do a 'mental walk through' of possible events. Kind of like a 'simulator' but of the mind rather than of the plane. And be sure to include a 50/50 mix of "Yes, I would still go for it." as it become meaningless and rote if the answer to every scenario was "Oh, I'd stay home and not fly.".

A vast number of the fatalities are NOT because the pilot thought through the choices-andconsequences but then made the wrong choice; they're because they did not even think through the choices-and-consequences in the first place. Just get in the habit of doing that, and fatalities will drop. Develop a sense of "Healthy Paranoia": Ask yourself "What could go wrong a few minutes from now, that I can mitigate by doing something right now?"

# 2) A pilot schedules a flight review. It's the first time the CFI has met the airplane owner. How does the CFI integrate this discussion into the flight review?

<u>Background</u>: A well-loved CFI/I at PWK ("Uncle Harold") would pull this on students as they were taxiing "Hey, see that Cessna off to your left, I'm thinking of buying it. What do you think? Do you like the paint? What would *you* pay for it???" and the only acceptable answer was "I can't look now, I'm flying the plane". But if the student *did* look to please the instructor, they were rebuked. This is your hint as to where I'm going with this.

After the polite introductions, consider saying something like:

"So Bob, tell me about your past flying. Tell me about your checklists, weight and balance, and such. Do you bother with any of that stuff???"

See if Bob can be coaxed into 'bragging' about 'being cool' or says something like

"After all these years, I just gotta gut feeling for all this and I don't need checklists or paperwork because of all my experience, you know?!"

To which the instructor might respond:

"No Bob, I don't 'know'. And it concerns me that you fly that way. It makes me uncomfortable"

and then the individual conversation manifests itself. But again, the key is that you've drawn out the riskiness of the pilot without being heavy handed, dictatorial, condescending or confrontational. You are not rebuking him, just stating that YOU are 'uncomfortable', which is non-confrontational. And it sets the tone. A tone of disapproval if "Bob" starts 'cutting corners' or such. People are sensitive to peer pressure, and want approval – especially from someone that signs off on their flying privilege. It's human nature to 'put your defenses up' if threatened, and then stop listening to *anything* you say. You don't want to go that far. Yes, it will be a little bit of a tense, possibly unpleasant conversation – disapproval does that to any conversation. You can't always be liked. But in this case it is more important that you be diligent rather than that you be liked.

# 3) A potential student pilot comes for their first lesson. The instructor wants to screen the potential student for attitudes toward risk management. How do they do that?

Consider these opening comments, which are designed only to see if the student falls into the 'clearly risky' category or not:

"So Bob, you want to fly. That's GREAT. I think you're gonna love it. But you also need to know that it's not like driving a car or a boat. It's not just physically harder, but the cost of screw ups is a lot more. If you run out of gas in an airplane, you're probably going to land in a field if you're lucky, wreck the airplane and maybe break a bone. Flying isn't for everyone. It takes responsibility. It's not hard to be safe, it's just easier to be careless. Are you up to that, or do you just want to go out and have fun?"

At this point the student will have one of two reactions:

- They'll stiffen up and balk at the lecture, or
- They'll just say "Uh, yeah, ok..."

So long as they do not balk, you are starting out on good terms. Besides identifying big risk takers up front, the point is to maintain the explicit specter of diligence and responsibility in the conversation.

If the instructor isn't quite sure of the response, they can try asking the question:

"On the spectrum of 'Thrill seeker' vs 'Responsible Enjoyment', where would your friends put you?

With a scale of "+3 for Thrill Seeker to -3 for Responsible", if they wavered on the first question and put themselves at a +2 or +3 on this question, you've just identified a potential problem here.

If they did balk at the first discussion or 'scored badly' on the follow-up question, then it becomes a personal question of do you just take the person's money or do you stop right there and work on the responsibility issue that you've already identified before you even get in the plane.

Possibly many of the '33% Academically Avoidable' fatalities could-and-would be eliminated if the pilots were simply informed properly, much like deaths from drunk driving, seat belt use, and smoking decreased when people were indoctrinated with the realities. But even with the massive campaign against drunk driving, alcohol related deaths have dropped by 50%, not 99%. So we must similarly accept that some pilots are never going to be responsible, no matter what you say or do. Some are just intrinsically careless thrill seekers, or maybe simply recreational pilots who just want an aerial version of motorboating which is a different personality but with the same result.

This is where the rubber meets the road:

If you don't want irresponsible people to be pilots, you can't just take their money and then bemoan all the irresponsible people in the sky that you helped put there.

#### Interesting psychological note from the "Weird, but true" department.

Many people will completely ignore warnings about killing themselves because that is so far removed from anything that they can relate to or even conceive of that they completely shut it out of their mind. But if you talk about 'crashing the plane, resulting in tens of thousands of dollars in damage', then that is something that they *can* relate to and that does get past their 'denial barrier' and sinks in more than 'death'. Looking at the inside front cover of this paper, the 'dead family' on the top may not register, but the 'crashed plane' might.

# Section III – Confronting the GA Community [3B] The Rank and File

Recall that my thrust here is primarily the 33% of deaths that fall into the easily, academically avoidable column.

There are 2 parts to this section:

- Entitlement mentality of some existing pilots to be re-certified simply because of tenure.
- Peer pressure to not be cocky/reckless/stupid

There are some pilots who don't want to admit that they have to actually WORK at being (and staying) a good pilot, as if having been certified for ump-teen years somehow gives them pilotemeritus tenure. If they find a reviewer who is demanding, they find another reviewer – preferably one will virtually rubber-stamp their sign off, based on their years of faithful membership as a pilot.

If you're reading this, you are probably the kind of pilot who at the very least tries to be vigilant, and that frame of mind and wherewithal is what will likely provide that 'little voice' to keep you from doing something irresponsible. You are probably not the problem. It's the irresponsible people who are not reading these pages that are likely the problem.

But the Good News is:

### You may not be part of the problem, But you can be part of the solution.

Lecturing or scolding our fellow pilots is not going to fix this. In the first place, no one wants to be the 'bad guy' to lecture or chastise a peer. And even if you did, they're going to blow you off. What might work? Peer Pressure.

The reality is that whether it be 'showing off' or anything else, people are typically responsive to peer pressure. Consider:

Pilot 1 : "Ehh, it was my first night landing in 6 or 7 months, but we landed just fine!" (Or maybe 'darting through the clouds' if not instrument rated...) Pilot 2 : "Well, good for you." Pilot 3 : "Glad it all worked out for you..." (all of which are IMPLICIT ENDORESEMENTS of wrongdoing)
Henry : "Getting away with something stupid is still stupid" Pilot 1 : "What did you say? Are you calling me stupid?" Henry : "Well, I wouldn't call it <u>smart</u>, but that's me..." Pilot 1 : "Hey, everything worked out just fine!"

Henry : "Getting away with something stupid, is still stupid in my book. Just my opinion"

Typically, the other person doesn't want to fight, they just want an 'Atta Boy' for pulling off something, and when they don't get it, they tend to back off. And no one is going to say that such *was* smart.

YOU have to stand up to this cock and swagger. Maybe it's leftover male adolescent locker room protocol to not criticize a risk-taker who gets away with it, but this is literally life and death.

And you have to be fair and not go throwing out that phrase simply because <u>you</u> wouldn't do what they did. It has to be blatant, as those people's actions *usually* are. If the person's night currency had lapsed by only 2 days *you* would be the one criticized, for all the obvious reasons. But 3 or 4 *months*, and you have fewer (if any) detractors. How do you know if it's warranted? Try this quick

# Section III – Confronting the GA Community [3B] The Rank and File

thought experiment before opening your mouth: If the result had been bad, would everyone have said (albeit in hindsight) "Well, that was stupid..."

Some refer to these as "Stupid Pilot Tricks", an apparent reference to the once-popular night show David Letterman and his "Stupid Animal Tricks". But this includes an implicit and understandable deference to not accuse the pilot directly. But in reality there was no 'trick' nor anything glib about this. Someone died. It was a Stupid Pilot. And to repeat, the point is not to belittle the dead, but to benefit the living. Sorry if I'm the only one rude enough to criticize the actions of the dead, but if "naming names" is a way to avoid yet another senseless death then fine: Hate me, but quit doing stupid things.

And if you can't at least pipe up once in a while, then those people will likely and eventually die. That is a tragedy in its own right, but unconscionable if they take other people with them.

### "Friends don't let friends drive drunk"

"Good Pilots don't allow tacit endorsement of stupid, irresponsible behavior"

This one has neither the cadence nor the alliteration of the drunk driving one. So let's go with the corollary to Rule #1



to become the catch phrase that stands up to bad peer behavior.

Citing real life confirmation:

A Jan 2021 AOPA Letters to the Editor, reader Marci Lyn Veronie of Maryland describes how they opened research forums asking

- "How many people PERSONALLY know a pilot who died in an airplane??"
  - ~75% of the hands went up
- "Ok, How many of you were surprised?"
  - Sadly, all but 1-2 hands went down –

They knew in their gut that these pilots would get themselves killed

Flying is not UN-Safe. See "Why you should (or should not) fly in a small airplane on the last page.

#### My brother, the alcoholic:

He is an example of the RIGHT way to fix a problem. In his case it is alcoholism via AA (Alcoholics Anonymous), in our case it's an unacceptably high fatality rate via ADM.

Wally is an alcoholic, who has been sober and not had a drink in over 30 years. Many would mistakenly correct me and say "Oh, you mean he is a *recovered* alcoholic!", and Wally would be the first to correct them that no, he IS an alcoholic. At every of his weekly AA meetings along with others, Wally introduces himself as

#### "Hello, my name is Walter, and I am an alcoholic"

In the 12-step program, the VERY FIRST STEP is to fully, bluntly acknowledge the problem. It is staggering to hear my older brother acknowledge and describe his failings in such nakedly critical detail. It was so objective, critical and unforgiving as to be the kind of talk people usually only say about <u>other</u> people. It was brutally honest. No excuses like "I sometimes have a drinking problem" (or "I sometimes do careless things in my airplane") or "Some people say I drink too much" (or "Some people criticize my flying"). Enough with the excuses already. The lesson is:

### The FIRST step is to be fully, and even brutally honest. NOTHING else matters if you don't take that first step. <u>Nothing</u>.

Frankly, I think I am an especially safe pilot: I take every course or seminar I can get. I have bought every upgrade or safety add on that my mechanic has ever suggested. I study all my avionics manuals inside and out and make my own notes to ensure that I can explain them to someone else to be sure that I understand it. I even wrote a book on ForeFlight out of 'my personal notes'. But every time I climb in the left seat, I try to remind myself:

### "I am just one stupid mistake away from killing myself, and my family"

Because gravity doesn't care a rat's ass about how many hours are in my log book, how many books I've written or how many avionic upgrades I take with me to the crash site. Gravity always wins. And after a year or so of flying this way in my plane, a reassuring feeling comes over me now, like when you were in school and you over-compensated for an upcoming test until you knew all the questions and answers, inside and out. Confidence comes from being prepared, not just optimistic.

Are you thinking

"Boy, that's depressing. I wouldn't want to fly with Henry. Why would his wife want to fly with a guy like that???"

But she does, and she does NOT like flying!<sup>16</sup> But she feels safe with me because she knows that I am always vigilant for anything that could harm her, <u>not</u> naively optimistic.

<sup>&</sup>lt;sup>16</sup> She gets motion sick in a 747 – as it's being pushed back from the jetway. God I love this woman!

### A few bad apples?

This is a highly subjective section, intended for insight and not bona fide quantitative analysis.

Is it possible that

'A relatively small percentage of pilots are responsible for a large portion of our bad fatality numbers?". *Possibly*.

Without getting into the boring description of "Normal, Gaussian (Bell-shaped) curve mono-modal distribution vs 'multi-modal distribution'", think of this analogy:

Many people die from lung cancer, most because they are heavy smokers

- are you at risk for lung cancer?

If you smoke a pack a day, then 'yes', but if you have never smoked then you are in the group that is possible but much less likely to get lung cancer. It is submitted that a similar grouping exists with pilots, albeit with nowhere near the clear delineation between smokers and non-smokers of the above example.

This begs the question

"What percentage of pilots need to be how bad to have 'good pilots' be contributing but a fraction of the total, overall fatalities?"

Basically, this is just 'weighted averages' below, where P is Percent of Pilots (Good, or Bad), and their respective Rates (R):

$$(P_g x R_g) + (P_b x R_b) = Avg$$

If you are a "Good Pilot", what is <u>your</u> Percent of overall fatalaities, given that your numbers are mixed in with the "Bad Pilots"

		What perce	entage of al	l Pilots are	"Bad Pilots	"?	
		50%	40%	30%	20%	15%	10%
	1	100%	100%	100%	100%	100%	100%
How many times	2	67%	71%	77%	83%	87%	91%
more risky are "Bad Pilots "	3	50%	56%	63%	71%	77%	83%
than	4	40%	45%	53%	63%	69%	77%
"Good Pilots"??	5	33%	38%	45%	56%	63%	71%
	6	29%	33%	40%	50%	57%	67%
	8	22%	26%	32%	42%	49%	59%
	10	18%	22%	27%	36%	43%	53%

So if it is argued that "Bad Pilots" are 4x Riskier than "Good Pilots", then it would take only 30% of the pilot population to be those kind of pilots and make the "Good Pilots' account for only half (53%) of the overall fatalities, which is to say that the fatality rate for "Good Pilots" is ½ of the '8x' factor described in Section 1A. Take that for whatever you want. To reprint below the subjective 'Careless to Risk' chart from Section 1B, we can suggest that because of the high cost of carelessness in flying, that "Risk" is exponentially related to "Carelessness". Which is to say by analogy that "having hiccups" is no big deal if you are a ditch digger, but very risky if you are a surgeon: the same symptom can have grossly different consequences, and the physics of flying are not forgiving of carelessness.

So while it can be argued that if you are 2x as careless in a car, you are at most 2x at risk. And with airbags and all the other safety equipment in cars and highways, it could be argued that the car will more-than-compensate for carelessness and that even a driver who is 4x as careless (talking on the phone, forgetting to fill the tank) is only 2x as likely to suffer a fatality because "you just don't die in a car unless you really do something *very* careless" (or the other driver does..)

By comparison, flying has the opposite "Carelessness to Consequences" ratio: That you are MORE likely to suffer consequences for what



might otherwise seem to be 'modest' carelessness (per the 'hiccup' example above). For example, being 2x as careless could carry 4x the consequences/risk, as depicted by the subjective graph above. Being 3x as careless could carry 9x the risk. Note that this is all subjective and hypothetical, and is submitted only to suggest a possible landscape of the pilot population.

What is the 'range' of risk? Consulting insurance rates for driving, there is as much as a **3x spread** in premiums for 'at risk' drivers (young, unmarried male typically) vs 'normal folk'. So even at face value we can assume that there can be a 3x factor of carelessness/risk in flying. And if you entertain an exponential relationship between carelessness and risk in flying, then there can arguably be a 9x spread in risk amongst pilots. If that were the case, then only 10% of the pilot population would need to be in that group for the rest of the population (Good Pilots) to be only 1/ 2 of the 8x fatality figure.

Again, note that his is all just hypothesizing and non-quantitative analysis submitted for your consideration. If accurate, it offers insight into the flying fatalities. But since the pilot population is so relatively small and there is no way to objectively measure 'carelessness', this discussion must be relegated to the 'gut feel' level of possible explanations.

If someone says "Flying isn't safe!", I don't argue with them.

From my years as a successful salesman of my own IT company, I respond with something like:

"Yes, compared to driving, flying <u>can be</u> about 8x riskier than driving a car. But that includes every Tom-Dick-and-Harry who gets into a plane. If you just avoid simple, stupid mistakes you remove a lot of the risks, since about 80% of the fatalities come from pilot error. It comes down largely to the responsibility of your pilot more than anything else."

A few reasons why I say this:

- First, "It's true". And even if it wasn't they are always going to believe anything that comes out of *their* mouth more than anything contradictory that *I* ever say! So why get off on the wrong foot and start arguing them when they are telling the truth?
- From a 'sales' point of view, this immediately establishes that "You are on *their* side!". And who has reason to distrust someone who agrees with you???. In fact, it shows how smart I am that I am agreeing with them! And then, continuing on with the truth, I show that in <u>our</u> case, this *isn't* the foreboding risk that they perceive a priori.

At an Organizational Behavior course at the University of Chicago Graduate School of Business we learned of military studies that showed that draftees who were 'sure they were going to die' were actually among the *lowest* casualty figures, assumedly because they were the most aware and diligent not to take unnecessary chances that would get themselves killed. While I'm not that insecure nor advocating anyone else be, the point is that **diligence improves survivability**.

### **Closing Thoughts:**

- Basic 'Due Diligence' is your easiest, and most productive tool in staying safe.
   Being Safe is easy, it's just that being careless is even easier.
- Fly as if the FAA were with you, as a "Am I doing something that I know is wrong?" reference.
   Many accidents fall into the "Yeah, I kinda knew it was wrong, but...." category.

And for bonus points:

Think of *what might go wrong* a little while from now, that you can do something about now.
 Fuel, weather, equipment, airspeed. Usually just the basics.

<u>Many fatalities are easily avoidable</u>, arguably up to about 1/2. It seems that recreational flying will always be riskier than recreational driving as the consequences of flying are intrinsically more severe – it's just the nature of the activity.

But I hope this paper highlighted some of the easy steps we can take to make flying safer!

-Henry

# About the Author DRAFT & Acknowledgements

### About the Author:

Henry is the proud owner of a Bonanza F33A ("Bruce", <u>www.N78HF.com</u>) that flies out of Chicago Executive Airport (KPWK). He re-entered flying in 2012 after a 30-year hiatus for starting a family and his business. He has just under 1,000 hrs. and has been instrument rated since 2014. He is the co-founder of the Executive Tenants Club, and President of the Midwest Bonanza Society. He is a frequent contributor to the ABS (American Bonanza Society) Magazine, and his articles have also appeared in AOPA and FLYING magazines. He has also written The Pilots' Handbook for ForeFlight, and is a member of their Alpha/Beta team. He has given educational seminars,

including WINGS credit. He is the founding President of an IT consulting company. Academically he has 2 degrees in Engineering from MIT where he did Defense research, and an MBA from the University of Chicago Graduate School of Business with a Concentration in Organizational Behavior. His first wife died of cancer at age 44, and he escaped a fatal cancer a few years after that. Having seen death so close and personally, he admits a personal and unapologetic vendetta against it. He is now married to Carolyn and has two grown sons.



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Fatal Crashes	32,166	30,056	30,202	31,006	29,867	30,296 30					
Drivers	17,466	16,470	16,520	16,838	16,474	16,864 1 <del>,</del>					
Passengers	6,158	5,766	5,896	6,106	5,972	6,451					
Sub Total1 storcyclists	23,695 4,976	22,307 4,594	22,483 4,692	23,017 4,986	22,510 4,630	23,371 2 4,518 4					
Pedestrians	5,376	4,910	4,779	4,818	4,457	4,302					
Pedalcyclists Other/	818	729	749	734	682	623					
Unknown Sub Total2	6,421	5,843	5,718	5,779	5,339	5.110					
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Traveled (Billions) Resident Pooulation CTION : ps://www BUTEC Table 2 Total fata Total fata Total ser Total acc Total acc Flight ho Rates pe Fatalities	3,095 321.419 <b>1A – I</b> 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc 7.bts.gc	3,026 318.907 FLYIP ov/cor ov/cor of T J.S. 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G	2,988 316.427 NG F/ ntent/u tent/u enera ersons	2,969 314.103 3 ATAL (us-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-generic) S-ge	2,950 H11.719 3 HTIES Heral-a Tal-avia C C ion <sup>a</sup> S 2010 9 45 3 25 2 21,65 0 2,11 1 1,11	2,967 2 09.347 30¢ iviationa- tiona-saf <b>otio</b> afety Da (R) 201 38 4¢ 36 32 10 1,47 71 27 38	Fatalities         per 100         Million         Vehicle         Miles         Traveled         a-safety-d         ety-data         n         Stc         ety-data         1         (R) 2012         18         438         247         1         1         0         273         U         20,881         U         2.10         U         1.18	1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.13 1.24 1.224 1.9,492 1.9,492 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,110 1.0,1	1.08 1.10 <b>CS</b> (R) 2014 424 234 1,223 257 19,617 2.16 1.19	(P) 2015 376 248 1,209 229 20,576 1.83 1,21	



https://www.aopa.org/about/general-aviation-statistics/active-general-aviation-aircraft-in-the-u-s ftp://ftp.census.gov/library/publications/2011/compendia/statab/131ed/tables/12s1069.pdf

#### Table 1069. U.S. Aircraft, Vehicles, and Other Conveyances: 2000 to 2009

[178,099 represents 178,099]

System	2000	2002	2003	2004	2005	2006	2007	2008	2009
Air: Air carrier <sup>1</sup> General aviation <sup>2</sup> (active fleet)	8,055 217,533	8,194 211,244	8,176 209,708	8,186 219,426	8,225 224,352	8,089 221,943	8,044 231,607	7,856 228,663	(NA) 223,877
Highway, registered vehicles (1,000): <sup>3</sup> Light duty vehicle, short wheel base <sup>4</sup> . Motorcycle Light duty vehicle, long wheel base <sup>4</sup> . Truck <sup>5</sup> . Bus	178,099 4,346 33,642 8,988 746	183,162 5,004 36,319 9,378 761	185,392 5,370 35,772 9,451 777	189,462 5,781 37,412 9,574 795	191,223 6,227 39,279 9,884 807	194,295 6,679 38,715 10,334 822	196,491 7,138 39,187 10,752 834	196,763 7,753 39,685 10,873 843	193,980 7,930 40,488 10,973 842
Transit: Motor bus. Light rail cars <sup>6</sup> . Heavy rail cars <sup>7</sup> . Trolley bus. Commuter rail cars and locomotives. Demand response. Other <sup>8</sup> .	58,578 1,306 10,311 652 5,497 22,087 7,705	60,719 1,448 10,849 616 5,631 24,808 8,033	61,659 1,482 10,754 672 5,866 25,873 8,626	61,318 1,622 10,858 597 6,130 26,333 10,544	62,284 1,645 11,110 615 6,290 28,346 11,622	64,025 1,801 11,052 609 6,300 29,406 12,454	63,359 1,802 11,222 559 6,279 29,433 12,953	63,151 1,948 11,377 590 6,494 30,773 14,953	63,343 2,059 11,461 531 6,722 34,235 17,766

https://www.faa.gov/o	data_rese	earch/avi	ation_da	ta_statis	tics/civil	airmen	statistics	<u>s/</u>		
These are Pilot Certificates to people with a current medical										
	TABLE 1 ESTIMATED ACTIVE AIRMEN CERTIFICATES HELD									
CATEGORY	2017	2016	2015	2014	2013	2012	2011	2010	2009	200
PilotTotal	609,306	584,362	590,039	593,499	599,086	610,576	617,128	627,588	594,285	613,74
Student 1/	149,121	128,501	122,729	120,546	120,285	119,946	118,657	119,119	72,280	80,98
Recreational (only)	153	175	190	220	238	218	227	212	234	25
Sport (only)	6,097	5,889	5,482	5,157	4,824	4,493	4,066	3,682	3,248	2,62
Airplane 2/										
Private	162,455	162,313	170,718	174,883	180,214	188,001	194,441	202,020	211,619	222,59
Commercial	98,161	96,081	101,164	104,322	108,206	116,400	120,865	123,705	125,738	124,74
Airline Transport	159,825	157,894	154,730	152,933	149,824	145,590	142,511	142,198	144,600	146,83
Rotorcraft (only) 3/	15,355	15,518	15,566	15,511	15,114	15,126	15,220	15,377	15,298	14,64
Glider (only ) 4,5/	18,139	17,991	19,460	19,927	20,381	20,802	21,141	21,275	21,268	21,05
Flight Instructor										
Certificates 6/	106,692	104,382	102,628	100,993	98,842	98,328	97,409	96,473	94,863	93,20
Instrument Ratings 6,7/	306,652	302,572	304,329	306,066	307,120	311,952	314,122	318,001	323,495	325,24
Remote Pilots 9/	69,166	20,362	NA	NA	NA	NA	NA	NA	NA	N/
Non PilotTotal 8/	671,222	652,943	728,329	717,399	707,155	701,291	695,515	686,717	682,315	678,18
Mechanic 8/	286,268	279,435	342,528	341,409	338,844	337,775	335,431	331,989	329,027	326,27
Repairmen 8/	35,040	34,411	39,363	39,566	39,952	40,444	40,802	41,267	41,389	41,05
Parachute Rigger 8/	6,192	5,851	8,846	8,702	8,491	8,474	8,491	8,407	8,362	8,24
Ground Instructor 8/	66,423	65,053	70,957	71,755	72,493	73,599	74,586	75,205	75,461	74,98
Dispatcher 8/	20,664	19,758	23,754	23,113	22,401	21,862	21,363	20,691	20,132	19,59
Flight Navigator	64	67	102	115	126	141	146	174	181	22
Flight Attendant	222,037	212,607	200,319	188,936	179,531	172,357	167,037	159,946	156,741	154,67
Flight Engineer	34,534	35,761	42,460	43,803	45,317	46,639	47,659	49,038	51,022	53,13

Boating: <a href="https://www.nsc.org/home-safety/tools-resources/seasonal-safety/summer/boating">https://www.nsc.org/home-safety/tools-resources/seasonal-safety/summer/boating</a>

### SECTION 1B – Excel Breakdown of each accident, from the NTSB

In 1967, the Congress created an independent NTSB within the newly formed Department of Transportation (DOT); expanded the NTSB's authority to include all modes of transportation. The NTSB is charged with: 1) determining the probable cause of transportation accidents 2) making recommendations to prevent their recurrence The NTSB is Responsible for Investigating All U.S. aviation accidents (except those of military and intelligence agencies). And Highway accidents



Spreadsheet :https://www.ntsb.gov/investigatio	ns/AccidentReports/ layouts/ntsb.aviation/index.aspx				
Secure   https://www.ntsb.gov/investigations/AccidentReports/_layoutst	Date Range : 1/1/2015 to 12/31/2015				
	Country : United States				
NATIONAL TRANSPORTATION SAFETY BOARD	Investigation Type : Accident				
	Injury Severity : Fatal				
HOME NEWS & EVENTS SAFETY ADVOCACY INVESTIGATIONS					
Home > INVESTIGATIONS > Accident Reports	Aircraft				
Event Start Date (mm/dd/yyyy) 1/1/15	Category : Airplane				
Event End Date (mm/dd/yyyy) 12/31/15	Amateur Built : All				
Investigation Type Accident					
Injury Severity	Operation : Part 91: General Aviation				
Aircraft Category Airplane					
marine marine and	Submit Query Download XML Download Delimited Text Reset				
This then downloads a .TXT file that uses the pipe	e character (   ) to separate (delimit) each column.				
To open this file as an Excel spreadsheet, just do	the following steps:				
(1) Open Excel as you normally would					
(2) Open the file just downloaded.	This is typically in C:Users/(your name)/Downloads,				
You will have change the file types shown	and will have funny name like 9e806b45-a65c-4e46-				
(lower right) to ALL, as ".txt" is not a file type	a841-ca9abb80c646AviationData.txt				
that Excel normally expects to open.	All Files (*.*)				
	Tools  All Files (">1 ("all";"adac" adam;" ada xalam;" All Excel Files ("all";"adac" adam;" adab;"adam;" ada Excel Files ("ad";"adac" adam;" adab;"adam;" ada				
	All Web Pages (".htm;".mht;".mhtmi) (MIL Files (".xml)				
(3) Excel will realize that this is not the standard	file format (this file uses the 'pipe' vertical bar character				
to separate columns, instead of the 'usual' comm	ha), and will automatically launch the following 3-step				
Wizard to guide you through the import process:	Test insert Winner Stran 2 of 2				
Text Import Wizard - Step 1 of 3	Delimiters				
The Text Wizard has determined that your data is Fixed Width. If this is correct, choose Network the data type that best describes your	Iab       Semicolon         Jet consecutive delimiters as one				
Original data type Choose the file that best describes your data:	☐ Comma ☐ Space				
<u>Delimited</u> - Characters such as commas or tabs separate each field.     Fixed width Fields are aligned in columns with spaces between each	<b><i>Q</i>ther 1 That's the 'pipe' key, just above the</b>				
Start import a wr. 1 🕂 File <u>o</u> rigin: 437 : OEM United States	backslash, next to the Enter key on				
My data has headers.	Data greview <b>YOUF KEYDOATC</b> kvent Id Investigation Type Accident Number Event Date Locat				
1 Event Id   Investigation Type   Accident Number   Event 2 20160104X11027   Accident   ANC16LA011   12/29/2015   J 2 001610302Y3C20   Arcident   MNC16LA011   12/29/2015   J	D0160104X11027         Accident         ANC16LA011         12/29/2015         Anch:           20151222X03629         Accident         WDR16FA042         12/22/2015         Cast:				
Cancel < Back Next > Einish	Cancel < <u>Back</u> <u>Next</u> Einish				
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This screen lets you select of an column and set the Data Format.	spreadsheet:				
General Converts numeric values to numbers, date values to dates, and all remaining values to text.					
O Do not import column (skip)					
General         General         MDY         General           Synth Id         Investigation Type         Accident Number         Synth Date         Locati A	A         B         C         D         E         F         G         F           1         Event Id         Investigal         Accident         Event Date         Location         Country         Latitude         Longiti				
COIGCIONNIDOP Accident ARC16LA011 12/29/2016 Anchor COIGCIONNIDOP Accident WPR16FA042 12/22/2016 Castro >	2 20160104) Accident ANC16LA( 12/29/2015 Anchorag United St 61.21917 -149.903				
Cancel < <u>Back</u> Next > <u>Finish</u>	4 201512220 Accident ERA16FAC 12/20/2015 Winder, C United St 33,935 -83.60				
To delete columns you dou't wort but it's a	the column (c. c. ( latitude) there wight all the c. Dubits				
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Column. Depending on your browser, you may no	eed to exit-and-come-back to get additional downloads				

. 1002	Table 1	0. Acci	dents, l	Fataliti	es, and R	ates, 1997 throu	igh 2016,	
HOME NEWS & EVENTS SAFETY ADVOCACY INVESTIGATIO							Ac	cidents
Home > INVESTIGATIONS > Data & Stats > Aviation Statistics							per	100,000
Aviation Statistics		Accidents		Fatalities			Flight Hours <sup>b</sup>	
Deview of Assident Data	Year	All	Fatal	Total	Aboard	Flight Hours <sup>a</sup>	AII	Fatal
Review of Accident Data	1997	1,840	350	631	625	25,600,000	7.168	1.359
Summary of US Civil Aviation Accidents for Calendar Year 2015	1998	1,902	364	624	618	25,517,000	7.430	1.411
Summary of US Civil Aviation Accidents for Calendar Year 2014	1999	1,905	340	621	615	29,246,000	6.503	1.159
<ul> <li>Summary of US Civil Aviation Accidents for Calendar Year 2013</li> </ul>	2000	1,837	345	596	585	27,838,000	6.574	1.214
<ul> <li>Summary of US Civil Aviation Accidents for Calendar Year 2012</li> </ul>	2001	1,727	325	562	558	25,430,000	6.775	1.27
	2002	1,716	345	581	575	25,545,000	6.690	1.32
Keview of US Civil Aviation Accidents, Calendar Year 2011 (ARA-14-0	2003	1,741	352	633	630	25,997,000	6.682	1.34
<ul> <li>Keview of US Civil Aviation Accidents, 2007-2009 (ARA-11-01)</li> </ul>	2004	1,619	314	559	559	24,888,000	6.493	1.262
Aviation Statistics for 2016	2005	1,671	321	563	558	23,167,712	7.204	1.38
2016 preliminary aviation statistics (xls file download)	2006°	1,523	308	706	547	23,962,936	6.347	1.28
	2007	1,654	288	496	491	23,818,668	6.936	1.20
Aviation Statistical Reports	2008	1,568	277	496	487	22,804,648	6.867	1.21
2004 Air Carrier Accident Data Used in Annual Review	2009	1,480	275	479	470	20,861,866	7.075	1.31
	2010	1,441	271	458	455	21,688,409	6.630	1.24
	2011	1,471	270	458	447	-	-	
	2012	1,472	273	438	438	20,880,993	7.045	1.30
	2013	1,224	222	391	386	19,492,356	6.264	1.12
	2014	1,224	256	423	413	19,617,389	6.239	1.30
	2015	1,210	230	378	375	20,576,072	5.847	1.09
	2016 <sup>d,e</sup>	1,266	213	386	379	21,333,747	5.925	0.98

#### 2015-2016:

Total Fatalaties are UP from 378 to 386,

but with a higher estimated hours of flying, that pulls the *rate* down to 0.99 (~1.0 to 1<sup>st</sup> decimal point) Total Accidents are UP from 5.8 to 5.9, Fatal accidents are DOWN from 1.1 to 1.0

#### Links to videos:

Dick Van Dyke: <u>https://drive.google.com/open?id=1aSEL7IVxHv0U\_1yWbo5Ecd41q81Tgl9v</u> Frasier: <u>https://drive.google.com/open?id=1zIFDE5ZfSQ3n\_I9G65\_R7hwFCutwMQSU</u> Simpsons, The Truth: <u>https://drive.google.com/open?id=1tFzTCuleX-Ygslhd9iiR2whJo-4s0Koj</u> Simpsons, Society's Fault: <u>https://drive.google.com/open?id=1sqdFaC4hJoRvxdf89OU\_WXK2pYFW9WRM</u> Cheers: <u>https://drive.google.com/open?id=1jHwpAAr6aGh9OMA\_neYwd82WvdQqxkPv</u> You can download each image as a full page PDFby clicking on the hperlink below each image, or you can find the image on the <u>www.lsFlyingSafe.com</u> website



# **FLYING** is not for everyone.

Flying can be the most **exciting**, **liberating** and **rewarding** experience of your life!

But it takes constant diligence and responsibility. Being safe is easy, but being careless is easier. Even a simple error like running out of gas can have grave consequences.

Being a responsible pilot is a constant challenge. Can you accept that challenge?

Most anyone *can be* a pilot, but not everyone *should be* a pilot. If you want all "fun & games", *don't be* a pilot. The NTSB has enough work to do.

### Why you should (or should not) fly in a small airplane Honest observations on the risks of flying.

#### Yes, "FLYING IS NOT PERFECTLY SAFE"

Nothing is. If you rent a horse for a 1-hr trail ride you must sign a full-page waiver admitting that if you fall off and hit your head, you could die or be crippled for life.

It is also true that flying in small airplanes has a disproportionately higher fatality rate than other activities.

Why? Because while *flying is not intrinsically dangerous,* 

### "Flying is much less forgiving of carelessness"

So if your pilot is a '**hot shot'**, or '**bad boy**!', or even just casual about safety things, you are probably taking a high risk to get in a plane with them.

But if your pilot is one of those '**meticulous'** '**detail-minded'** folks who is anal almost to the point of 'excessiveness', you are arguably safer than riding your bike on a busy street.

The following graph illustrates this point:

First of all, cars are incredibly safe and are a high bar of safety to compete with since you can run into a brick wall at 30-40mph and probably walk away. Running out of gas is just an annoyance.

Aviation is not as forgiving, and a few careless, bad apples ruin it for everyone.

How carless? Many don't even check their fuel before takeoff, they fly into weather that they are told not to, they overload the airplane – the list goes on, and on....

Most accidents are very avoidable. "Pilot Error" is the most common phrase listed in NTSB reports of aviation fatalities.



### The largest factor in all this: Your Pilot.

Is he or she meticulous and conservative, or care free and casual about the whole thing? The closer to the former, the closer you are to being very safe.

Flying can be safe, but not if you are careless. It isn't hard to be safe, but it is even easier to be careless. See the whole statistics at www.IsFlyingSafe.com