Flight Training Capacity in the Context of Recent Legislation:

An Examination of the Impacts of Reduced Training Capacity,
and the Declining Rates of Airmen Certification

by:

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Executive Summary

Industry forecasts predict that the North American aviation industry will need nearly 82,800 pilots over the next twenty years. The ability of the flight training industry, given the current training model and curricula, to meet that demand is the subject of much speculation considering new rulemaking and regulations. The predicted shortages in the population of qualified pilots combined with new, and potentially more restrictive requirements to serve as a pilot in the Part 121 environment cause the flight training industry to be seriously concerned about its protracted ability to supply pilots to meet the growing need. If the capacity for training is not able to meet these demands, there is potential for serious threat to the viability of domestic air transportation. Potentially compounding the problem is historic annual declines in pilot certification rates, an aging instructor workforce, and reduced numbers of instructors who are becoming certified. In light of new rulemaking, it is unlikely that the flight training industry will be able to offer a continuous supply of qualified pilot to meet the demands of commercial carriers. Additionally, there is a detrimental, implicit mandate that career minded pilots work as a flight instructor to gain the experience required to qualify them for Part 121 employment. The industry should not look to the flight instruction community as the training ground for its Part 121 pilots. There will not be enough positions available to meet the experience needs, and it is not a productive approach to the provision of quality flight instruction.

This paper has utilized existing, publically available and some uniquely requested data from FAA sources in much of the analysis of pilot trends. The writers note that there are significantly more data points that would be helpful in analysis of these discussions more fully. In consideration of this, and in consideration of some errata that was experienced in some FAA

data, a full data request of a more wide ranging list of data points has been requested of the FAA. As NAFI obtains this data, the writers will endeavor to provide additional commentary and feedback to the industry, analyzing the more detailed information that is provided. We have not waited to provide this paper due to the concern that the receipt of the requested data from the FAA may require a lengthy wait and additional concern that data points requested may not be currently compiled and able to be provided by the FAA.

Analysis of existing difficulties in obtaining educational funding, contribute to further potential decline of the pilot population. Findings prove that the deficit between people wanting to pursue a career as a pilot, the need for qualified pilots, and the capacity of the flight training industry to accommodate the amount of trainees that will be needed to maintain a minimum functionality of domestic air transportation is growing. Newly proposed regulations promise only to exacerbate this situation and potentially decrease the attractiveness of aviation as a career path.

This paper will discuss these and other related concerns that have been identified. Safety must be maintained, high quality and appropriate training must be provided, but the industry must be managed in a way that will promote viability if the United States is to remain a leader in aviation.

Fewer People Are Becoming Certificated as Pilots

Frequent news-media coverage and industry sources have brought attention to the potential pilot shortage, but no resources have yet succinctly discussed the effects on the flight training industry. Predicted increases in passenger demand will drive the significant need to train qualified candidates for service in the airline environment.[i] While there have been similar warnings in the past, at no time has there been such a confluence of negative impacts to the industry within the same time frame. The concurrence of these factors indicate that a significant shortage is likely compound the negative impact on domestic aviation. Air transportation in the United States has grown out of convenience or novelty for vacation tourists. It is critical infrastructure upon which the country relies for day-to-day economic viability. In a 2009 white paper by the Airline Pilots Association, *Producing a Professional Airline Pilot* ALPA noted that "the number of people pursuing a career as an airline pilot has decreased significantly because of the high cost of training, low initial pay, and uncertain career prospects."[ii]

While this paper utilizes data supporting the expected pilot shortage, the focus will be related to the effects of this shortage on the flight training efforts, and how they will further affect or accelerate the shortage. The research findings of this paper will highlight historic rates of pilot licensure against the minimum number of pilots needed to become certified within the next 20 years for Part 121 employment. To create a structured flight training sector able to meet the needs of pilot hiring in the future, there must be a strong community of competent flight instructors with safe, effective and efficient training practices to produce qualified pilots. One of the aims of this paper was to correlate a previously unknown data point reflecting the actual percentage of certified flight instructors who are actively engaged in flight training with the

projected ability of the flight training industry to continue producing such career pilots. The flight training community itself acknowledges the need for reform in the overall model of flight training. Intervention from regulatory and legislative bodies, however, will likely be necessary as a collaborative effort.[iii] These concerns must be addressed in the context of direct effects upon the industry, the combined effects of economic conditions, training curriculum, recent legislation, and various administrative barriers to commencement of training. These factors make it more difficult and increasingly disadvantageous to obtain certification and may discourage potential career-minded student pilots. Based on trend data, there is a shrinking pool of applicants potential career-oriented flight students.

Following the year 2000, the FAA developed a new pilot rating known as the Sport Pilot certificate. This was an addition to the two traditionally available "entry level" certificates, the recreational pilot and the private pilot certificates. Though the recreational pilot license requires considerably less training and investment, there are restrictions on the privileges and use, and it is minimally pursued. The flight training industry thought that the new Sport Pilot certificate could have been an entry point that would encourage individuals to become involved in aviation at the lowest possible level, and develop the talents and interest of potential career pilots. Unfortunately, increases in the certification of new pilots did not, as was previously expected, accompany the advent of these ratings.

Fewer people becoming certificated pilots and pursuing advanced pilot certificates and ratings. Extrapolating historic trend data produces not only a declining number of pilots overall, but a dramatic decrease in pilots who are specifically qualified for employment in commercial aviation operations. When analyzing pilot certification trends, data relating to “written”

knowledge tests administered is often cited. Knowledge test occurrence levels in conjunction with overall pilot certification numbers help gauge overall pilot training activity. Completion of a knowledge test can signify the completion of minimum required ground instruction. The trends, as would be expected, are similar. Considering that the knowledge tests are a required step in the process of pilot certification, the fact that less people are taking these tests is an indicator that fewer people are enrolling in the initial stages of flight training. The data shows the number of people who passed a knowledge test, but then did not complete the remainder of their training and earn a rating or certificate as a result. Below are the knowledge test counts over a short, but recent period, 2002-2009, during which marked declines are notable *(All tables and data are derived directly from information provided by the Federal Aviation Administration).*

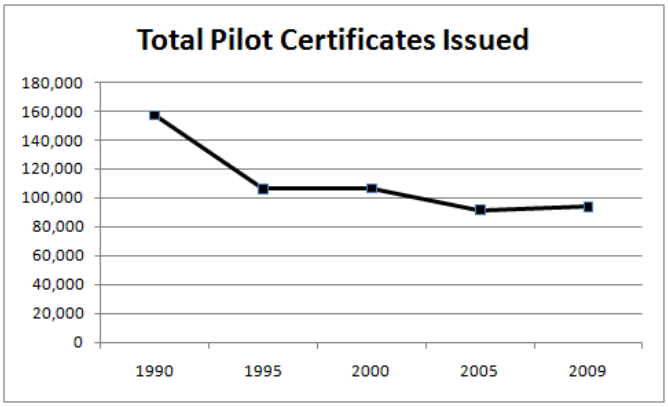
									Percent	Percent
	Year								Decrease	Decrease
Written Test	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2002-2009**	**2008-2009**
Private Pilot Airplane	34748	31635	29851	28132	27491	29108	28473	24098	30.65%	15.37%
Instrument Pilot Airplane	16840	13875	13794	12835	12731	14704	15785	12986	22.89%	17.73%
Commercial Pilot Airplane	10427	8573	8408	8018	7697	9405	10665	9054	13.17%	15.11%
ATP	5563	4852	6193	6368	6722	7927	5997	4223	24.09%	29.58%
Flight Instructor Airplane	6509	5423	5362	5028	4530	4659	4797	3743	42.50%	21.97%
Sport Pilot Airplane	0	0	5	671	679	831	784	740		5.61%
Total Test Volume	67643	58979	63613	61052	59850	66634	66501	54844	18.92%	17.53%

As a result of the limitations of this data, it is more valuable to look at the actual certification events, the practical test, to determine how many pilots are earning airman certificates. This overall trend data is undoubtedly a predictor not only for the future of flight training, but foreshadows the potential depth the coming pilot shortage.

Reviewing the total number of certificates and ratings inclusive of the private pilot, commercial pilot, instrument ratings, Airline Transport Pilot license (ATP), and others, the data reveals that as recent as 1990 the FAA issued over 150,000 certificates per year, but by 2009

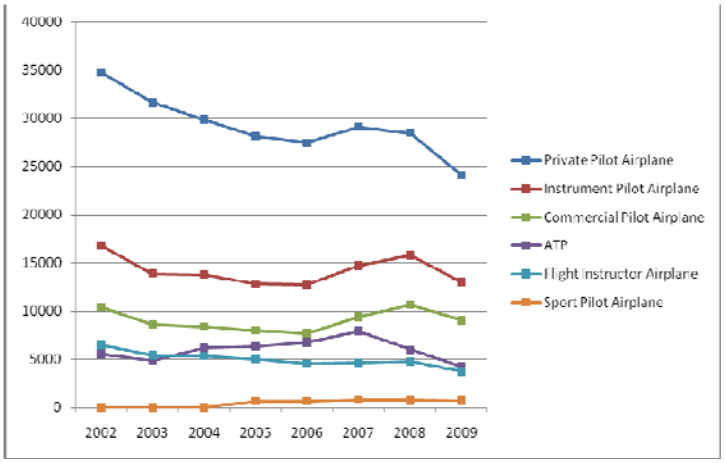
issued only about 90,000 certificates, an overall decline in pilot certificate issuances of over 40%.

Total Pilot Certificates Issued	
1990	156,955
1995	106,082
2000	106,517
2005	91,446
2009	93,861

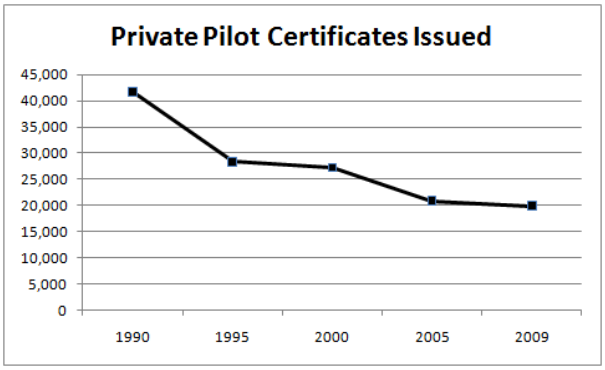


Private pilot certificates issued over the same period declined nearly 50% from the roughly 40,000 issued in 1990 to 20,000 in 2009. That in two decades the number of private pilots licensed annually has dropped so drastically is an indisputably predictive factor for industry analysis.

A 20 year comparison indicates a declining base population of private pilots, the pool from which the industry will develop future flight instructors and pilots with advanced ratings. The following graphs show the composite rates of certification over recent years. All of these are showing mean downward trends:



Private Pilot Certificates Issued	
1990	41,749
1995	28,333
2000	27,223
2005	20,889
2009	19,893

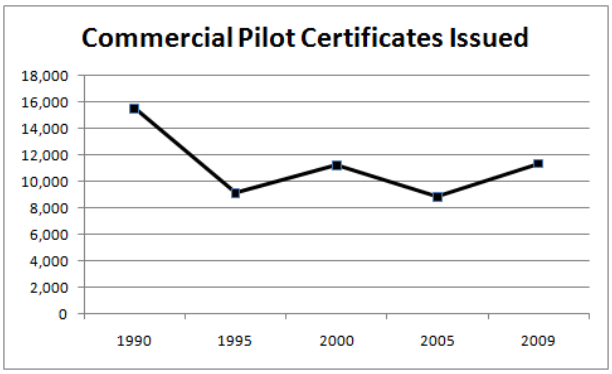


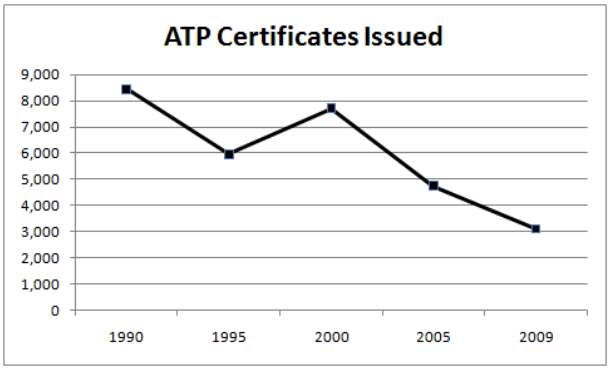
On February 27, 2012, the FAA issued a Notice of Proposed Rulemaking which would require all pilots occupying the flight deck of a commercial airliner to hold an Airline Transport Pilot (ATP) certificate, the highest attainable "level" airman certificate.[iv] Not everyone seeking flight training, or holding a license desires to become a professional pilot; this fact, however, makes the populations of higher level certificates like the Commercial Pilot and ATP more vulnerable, evidenced by a nearly 60% in certification over the same time period. The significance of this downtrend is at least as important as private pilot licensure data. There are not as many individuals progressing through flight training and obtaining the higher level certificates which are mandatory for a career as a professional pilot.

Commercial Certificates Issued	
1990	15,500
1995	9,133
2000	11,213
2005	8,834
2009	11,350

ATP Certificates Issued	
1990	8,437
1995	5,965
2000	7,715
2005	4,750
2009	3,113

In the absence of a sufficient supply of individuals with the credentials to act as a flight crewmember, repercussions could include airlines' inability to maintain regular scheduled service.





Active, certified flight instructors are vital to the industry's future. This is the determinant factor in the industry's ability to train the number of pilots that commercial aviation will need. The Certified Flight Instructor (alternatively known as the "CFI") certificate follows the trend of declining certificate issuance present in both data sets for the Commercial and ATP. There is a roughly 38% drop in the number of CFIs being certificated each year.

The Problem is Not Unique

The problems currently facing the aviation and flight training industries in the United States are not unique. Though the population of certified pilots is comparatively smaller in Europe than in the United States, the rising costs of flight training combined with difficult economic times are problems shared on both continents. Martin Robinson, chief executive of the Aircraft Owners and Pilots Association in Europe was quick to point out additional obstacles to recruiting and retaining new students.[v] In the UK as in the United States, a slew of new regulatory changes to pilot training aimed at improving safety have, in his words, only added another layer of "costly, unnecessary bureaucracy" to the process of becoming a certified pilot. Robinson points out that the flight training has quite simply failed to "re-ignite the romance of flying," or exploit the "cool factor" of learning to fly. The largest pilot's union even

acknowledges that "industry turmoil has had a negative effect on the desirability of the airline pilot career."[vi]

Less than one percent of the world's population are certified pilots. Growth in Asian travel, particularly in China, has correspondingly manifested itself as a pilot shortage as well. China's largest low-cost carrier, much like the domestic Southwest Airlines, has been forced to limit flight schedules, ground airplanes, and accept lost revenue simply because they do not have enough qualified pilots.[vii] But in Europe as in the United States, the largest growing sector of the certified pilot population are those between the ages of 40-60.[viii] These individuals typically have more disposable income, allowing them to pursue flight training at their leisure, but not in pursuit of a future career.

Why Does This Make the Problem Worse?

Boeing's forecasts imply that a consistent licensure rate of a minimum 4,100 pilots per year would be mandatory for industry viability (inclusive of former military pilots transitioning to civilian employment). While such a prediction makes the historic licensure data appear insignificant compared with the rates of annual certification of Commercial and ATP pilots, consider the nature of the flight training industry. Earning the certificates necessary to become a career pilot is a protracted process which can take years; Airline Transport Professionals Flight School estimates that nationwide, flight schools have about 12,000 students enrolled annually, with an even greater number needing to obtain at least one or more of the required licenses on the path of a Commercial or ATP certificate.[ix] Employment as a CFI is widely accepted as a stepping-stone to a career as a professional pilot while instructors built time and experience necessary to become marketable candidates for careers with the airlines.[x] Especially in today's

market, there are very few CFI's who earn the rating with the intention of spending a career as a flight instructor. Based on discussions between the National Association of Flight Instructors and the CFI community, CFIs who are using the profession to build experience typically spend between six months and two years acting as a CFI, with notable differences depending upon airline hiring behavior. There is significantly higher turnover in the active flight instructor group when airlines are hiring. A diverse sampling of university and academy training programs around the country exhibit turnover rates in instructional staff between 60-80% within an average time period of 8-12 months, with outliers as short as 4 month periods. According to pilot-career advisor Wayne Phillips, the last hiring peak, circa 2007, saw airline recruiters "pilfering flight schools and drafting CFIs onto the flight deck."[xi] That behavior is already happening again with recent "direct hire" programs that virtually guarantee a job to qualified graduates of certain flight training institutions with FAA approved curriculum.

It was during that peak in 2007 that the government took action to slow the crippling pilot shortage by passing the "age 65 rule." House Bill H.R. 4343 extended the mandatory retirement age from the previous age 60 to age 65, granting senior commercial pilots more time to work. The rule was a temporary stop gap measure, but during the ensuing time period the aviation industry has done little to change the conditions that would allow it to occur again. While the immediate effect was indeed to stem the tide of voracious hiring and stabilize the workforce, its long term effect was simply to delay and exacerbate the shortage of qualified pilots.

Beginning in 2012, large numbers of pilots previously scheduled to retire at age 60, who are still employed under the "age 65 rule" will retire in large numbers at exactly the time demand, and thus employer need, will rise sharply. Both *Business Week* and *USA Today* noted

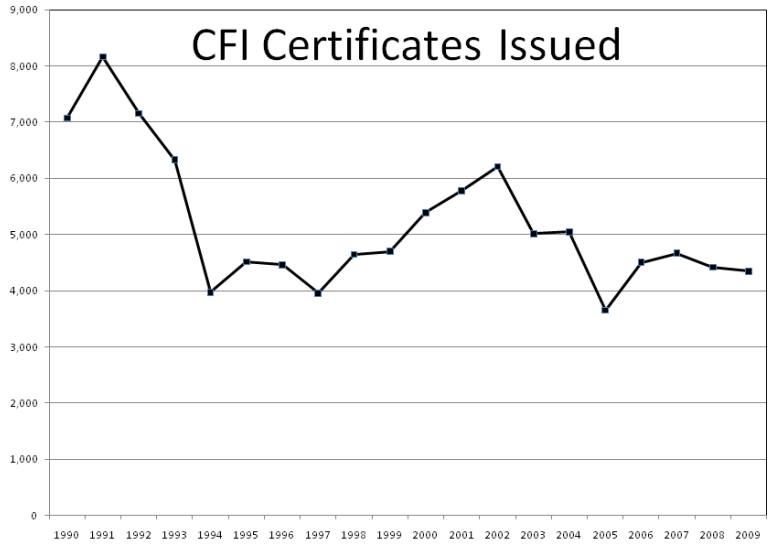
the legacy carrier American Airlines as an airline experiencing the effects of the retirement age requirement becoming a reality. *Aviation Week* noted a similar concern for Delta Airlines, with both carriers expecting to lose hundreds of pilots this year alone due to retirement.[xii] [xiii] [xiv] If the flight training industry can't fill jobs that are being vacated by retiring pilots, the airlines will be required to reduce schedules to minimum operable levels. In such a scenario, according to industry analysis, foreign air carriers stand to benefit from domestic airlines' inability to continue regularly scheduled service. In such a contingency, those air carriers may be granted "ex-pat contracts," and tax treaties and benefits which would allow them to train and staff routes domestic carriers are otherwise unable to service.[xv] Wayne Phillips, alongside industry experts like Louis Jones of the infamous career advisor "Fltops.com," is calling for the next decade to be the "longest and largest pilot hiring boom in the industry." According to FAA data, the combination of ATP and Commercial pilots as of January 2011 included 284,564 of the total 627,588 pilots that the FAA has in its data systems. They represent 45.3% of the overall pilot population. Of this group nearly 20% are already over the age of 60. These are the pilots who will "age-out" of employment in the coming years.

CFI Certification Trends

The role of the CFI is obviously critical to the production of qualified candidates for the airline workforce, but less people want to become pilots, so there is a corresponding decrease in demand for flight instructors. One of the aims of this paper was to synthesize existing data reflecting the actual percentage of the over 96,000 flight instructors who are actively engaged in flight training. The results are alarming; an overwhelming majority of the current CFI community is not actively instructing, a commonly held industry norm, but confirmed by a statistic more drastic than previous casual consideration. Activity levels of the current population

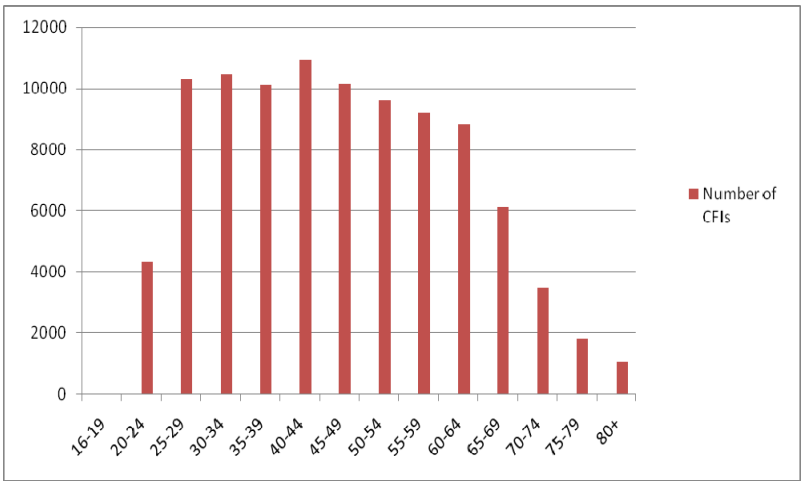
of CFIs, is probably the most disturbing data point of all. In reality, only about 13% of the nearly 96,000 CFIs are actively instructing new pilot applicants on any given year – a statistic previously unnoticed by the flight training industry. It is natural to infer that, typically, older instructors are less involved in active instruction than their younger counterparts, who account for the slower-growing segment of the CFI population. The question is: once a majority of active CFIs are hired by the airlines, how will it affect the ability of the flight training industry to continually produce qualified candidates?

As fewer young CFIs are certificated each year, the average age of the CFI population rises. With an aging instructor workforce and a pronounced decline in the certification of new instructors, the aviation industry will surely soon be faced with a deficit between CFIs available to train thousands of students to fill seats in airline cockpits. The graphs below show the trend of CFI certification over the past 20 years.



CFI Certificates Issued	
1990	7,071
1991	8,164
1992	7,151
1993	6,328
1994	3,970
1995	4,513
1996	4,459
1997	3,958
1998	4,647
1999	4,697
2000	5,386
2001	5,781
2002	6,211
2003	5,012
2004	5,044
2005	3,654
2006	4,506
2007	4,667
2008	4,415
2009	4,348

CFI Age Breakdown as of January 2011



CFI Age Breakdown		
16-19	37	0.04%
20-24	4326	4.48%
25-29	10315	10.69%
30-34	10445	10.83%
35-39	10124	10.49%
40-44	10940	11.34%
45-49	10154	10.53%
50-54	9596	9.95%
55-59	9208	9.54%
60-64	8832	9.15%
65-69	6135	6.36%
70-74	3473	3.60%
75-79	1826	1.89%
80+	1062	1.10%
Total	**96473**	

A clarification about the CFI certification process is necessary to understand the measurement of "active" instructors: the CFI is the only pilot certificate issued by the FAA with an expiration date (the Private, Commercial, ATP, etc, are all indefinitely valid from the date of issue unless suspended, revoked, or voluntarily surrendered by the airman). A Certified Flight Instructor thus has an obligation to participate in "refresher" training every 24 months, or undergo another practical test. By far, the most telling metric for the flight training industry are the activity levels of CFIs. Just because an individual is certificated as a flight instructor does not imply they actively engage in providing instruction. In fact, many of these instructors keep their certificate active while they work in professional pilot positions that may prohibit them from providing instruction. The data below is derived from activity reports generated by the FAA's certificate application system (IACRA) conveys the actual activity level of CFIs by. showing the percentages of CFI's who have actively endorsed applicants in each of the preceding five years for certificates; a practical test.

Percentage of CFI's Who Actively Sign Applicants Each Year					
Year	**2010**	**2009**	**2008**	**2007**	**2006**
Total Number of: CFI Certificates Held	96,473	94,863	93,202	92,175	91,343
CFIs who Signed Applicant for Practical Test	13,267	12,797	14,754	13,722	14,382
Percentage of Active CFI's	13.8%	13.5%	15.8%	14.9%	15.7%

What the data doesn't immediately reveal, however, is what percentage of CFIs repeatedly account for endorsements over the course of multiple years. As a result of the high turnover of CFIs, one could correctly assume that such continuity is an even smaller percentage of the active instructors.

Concerns About Training Capacity

There is no feasible way given the current status of the flight training industry, and industry standard training model, to continuously supply qualified pilots for the demand of air carriers. Compounding the problem is the regulatory requirement that an airmen be certificated as a CFI for a period of 24 calendar months before they themselves can endorse another pilot for a practical test to become a CFI. Even in the presence of external factors which might encourage more people to pursue careers as professional pilots, the flight training industry would need a phase-in period during which more CFIs could be trained and qualified. The rapid turnover of flight instructors moving on to an airline leaves many flight training providers with few instructors who can train new CFIs.

As stricter regulations for career pilots begin to take effect, the probability is high that university and collegiate flight training institutions will become the preferred method of flight training, as they will be able to offer students accredited curricula which could decrease the number of flight hours a candidate needs in order to be considered for employment.

It is in the university and collegiate environment where the problems with CFI retention could become the most serious, as graduate-instructors with steady numbers of students will build the necessary experience for airline employment more quickly, thus exacerbating the problem of high turnover.[xvi] The industry-accepted, transient nature of employment as a CFI in the days of rapid airline hiring resulted in a lack of instructors, and qualified airmen to train new instructors to take their place. These turnover rates barely allow new instructors to learn how to perform the basics of their job, let alone develop the skills of a good aviation educator.

Funding Questions

Funding flight training is a significant hurdle that must be mitigated if the pilot shortage is to be averted. The ramifications for the industry as a whole are obvious. Long established flight training programs have begun to close, further decreasing industry-wide ability to train the necessary, constant stream of pilots.[xvii] [xviii] [xix] In the United States, there are very few options for funding a pilot training curriculum. In the university and collegiate environment, there exists some access to student loan programs, although the continued availability of which remains unclear as a result of recent rulemaking from the Department of Education. In a recent final rule issuance from the Department of Education[xx], the measure of "Gainful Employment"[xxi] was introduced into the consideration of whether funding for financial aid would be allowable in various educational disciplines. The proposal includes a profile of the expected career earnings

and the graduates' ability to repay the loans. Aviation degrees that lead to pilot careers earned at certain flight training institutions, which could include technical schools, "career colleges," and FBO's, may not meet the proposed requirements.[xxii] The high cost of pilot training may make aviation a non-viable career option if financial aid is not available to candidates. These considerations apply to students who seek training at institutions that are currently eligible for financial aid, most commonly collegiate and university programs. Outside these environments (in local FBO training, academy based training, etc), funding resources to pursue pilot training will be more difficult to obtain. In most cases, candidates have no options, leaving them to paying for their training through personal resources, or not training at all. This leaves many academically qualified, potential candidates unable to pursue the career. In some cases, the volume of students funding their own education while pursuing the necessary steps toward a career as a professional pilot has dropped dramatically. At one flight school, "self-funded students" account for only 10% of the enrollment, while airlines overseas are funding the remainder of students' educations as new hire recruits.[xxiii] The general appeal of a pilot career must be one that makes financial sense if it is to remain vibrant. A candidate must be able to pursue a career that allows payback of the costs of training in a reasonable time period.

Current FAA Rulemaking indicates a potential worst case scenario that would require a pilot to have an Airline Transport Pilot (ATP) rating with a minimum of 1,500 flight hours.[xxiv] Should this be the case, the cost to build experience beyond minimum training requirements to fill in the gap between training and employment qualification would be significant, and likely prohibitive. The following chart is a realistic consideration of the potential costs a student pursuing a career as professional pilot might face if these requirements become reality. While the numerical values for each cost per item, such as the cost for an airplane or the instruction rate

are only estimated samples, they are representative of what might be found at lowest levels if someone wanted to pursue this type of an approach to training. We recognize likely fluctuation of actual cost, but the model itself represents a conservative estimate.

It is important to note that this chart represents only the flight instruction, and not tuition, ground school fees, additional course requirements, texts, and/or supplies. In these assumptions, we have included minimum experience levels for flight times and the times for experience building outside of the flight training process. The result is that the end total cost in the chart below is likely a very minimal estimate for an ab-initio student to an ATP rating with the required 1,500 hours for employability. Practical experience indicates that these costs would probably be higher in reality, as in most cases students do not earn a certificate with the minimum regulatory hours requirement. The FAA's NPRM proposes to a new "restricted" ATP certificate for graduates of four-year aviation baccalaureate programs which would qualify such students for the certificate with 1,000 hours, as opposed to 1,500. The cost estimates above do not account for university tuition.

Estimated Pilot Costs for 1500 Hour Experience Point and Minimum Ratings for Employment

Private Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$150.00	40	$6,000.00
Instruction	$40.00	60	$2,400.00
Knowledge Test			$150.00
Practical Test			$350.00

Instrument Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$150.00	40	$6,000.00
Instruction	$40.00	60	$2,400.00
Knowledge Test			$150.00
Practical Test			$350.00

Commercial Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Estimated**	**Total Estimated Cost**
Aircraft	$180.00	20	$3,600.00
Instruction	$40.00	20	$800.00
Knowledge Test			$150.00
Practical Test			$350.00

Multi-Engine Rating			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Estimated**	**Total Estimated Cost**
Aircraft	$250.00	15	$3,750.00
Instruction	$40.00	15	$600.00
Practical Test			$350.00

Time Building			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Estimated**	**Total Estimated Cost**
Time between Instrument and Commercial	$100.00	150	$15,000.00
Time after Commercial to 1500 Hours	$100.00	1,235	$123,500.00

	Total Minimum Cost:	**$159,700.00**

Traditional arguments have supported newly certified pilots "gaining experience" while working in other positions such as flying charter or as flight instructors instead of directly purchasing flight time through aircraft rental. Many of these jobs are no longer available to entry level pilots due to changes in insurance requirements for charter operators and corporate aviation departments. Many operators now hire staff away from the airlines, utilizing airline experience as the flight time required to employ pilots in charter and corporate flight environments operating technically advanced equipment under increasingly restrictive insurance minimums. The flight instructor path remains an option for some, and therefore must be considered.

Assuming a candidate did, in fact, secure employment as a flight instructor, the cost breakdown may look similar to the chart below. Still, this situation represents a significant cost for a pilot to incur knowing they will need to repay student loans, and does not account for university tuition.

Estimated Pilot Costs for 1500 Hour Experience Point and Minimum Ratings for Employment With CFI Experience

Private Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$150.00	40	$6,000.00
Instruction	$40.00	60	$2,400.00
Knowledge Test			$150.00
Practical Test			$350.00

Instrument Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$150.00	40	$6,000.00
Instruction	$40.00	60	$2,400.00
Knowledge Test			$150.00
Practical Test			$350.00

Commercial Pilot			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$180.00	20	$3,600.00
Instruction	$40.00	20	$800.00
Knowledge Test			$150.00
Practical Test			$350.00

Multi-Engine Rating			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$250.00	15	$3,750.00
Instruction	$40.00	15	$600.00
Practical Test			$350.00

CFI Certificate			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Aircraft	$180.00	20	$3,600.00
Instruction	$40.00	20	$800.00
Knowledge Test (2)			$300.00
Practical Test			$500.00

Time Building			
Cost Area	**Estimated Cost Per Hour**	**Minimum Hours Required**	**Total Estimated Cost**
Time between Instrument and Commercial	$100.00	150	$15,000.00
As a CFI	$0.00	1,235	$0.00

	Total Minimum Cost:	**$59,600.00**

The Flight Instructor Constriction

Opponents to sweeping training reforms argue that pilots will gain the experience needed with higher hiring minimums working as flight instructors. Not only is it problematic to utilize such a transient position to train highly qualified pilots, but it also presents logistical difficulties. The commercial aviation industry should no longer rely upon a steady stream of flight instructors from which to fill cockpit seats. From a philosophical point, to consider the role of the instructor who trains commercial pilots a “stepping stone on the way to a real job" is a disservice to the industry, a discussion worthy of the flight training industry, but not within the scope of this paper. Opportunities to build meaningful experience outside of flight instruction are scarce.

The constriction is based on the fact that the ratio of students to instructors is not 1:1. During research, we sampled 10 of the top providers of flight training in the United States (including university and large academy training providers). The dataset showed an average ratio of 7.88 students per instructor. The ratio implies that for every 7 or 8 students that want to pursue an aviation career, only 1 of them will likely find employment as a CFI.

This constriction means that the industry does not have the ability to provide newly certified pilots with experience at a sufficient level through work as a flight instructor. Using temporary work as a CFI is not an option that should be considered viable, if for no other reason than the basic math and common sense that show a constriction in supply under this method.

There will never be enough instructors working, while attempting to gain experience, at any point to adequately serve the demand for pilots in the airline environment. A constriction in

the supply chain exists here. The only solution is to formulate alternative means of producing a constant flow of hirable candidates with appropriate experience levels to meet regulations.

Implications for the Future

On August 1, 2010, President Barack Obama signed HR 5900, the Airline Safety and Federal Aviation Administration Extension Act of 2010, into law. The bill contained language directing the FAA to change the minimum requirements for new hires to become qualified first officers with commercial air carriers. In a testament to the potential impacts of the law, the FAA and the Government Accountability Office acknowledged that it will "likely reduce pilot support for [commercial] air carriers…"[xxv] [xxvi] Historically, any individual with a commercial pilot certificate was considered to be legally qualified to serve as a first officer. To address the Congressional mandate, the FAA convened a number of aviation rulemaking committees (ARCs) comprised of industry experts to advise the rulemaking process and make recommendations which align with the act's goal and improve safety. Congress expressed the desire to establish a minimum threshold of flight experience time, though exactly how much has been the subject of much debate. The flight training industry seems to embrace a reduction in minimum time for applicants who have undergone training in an FAA approved curriculum, evidenced by the contents of the NPRM.[xxvii] While a final rule has not yet been published, the implication is that major changes in the flight training industry are imminent as flight schools alter their practices to meet the requirements necessary to qualify their students for a potential credit-for-time model thus making them more marketable as a career pilot.

While the legislature chose 1,500 hours as a preferred minimum amount of experience required to maintain an adequate level of safety at the commercial air carriers, significant

research has demonstrated that lower-time pilots actually required less remedial training and had less unsatisfactory performance evaluations when the candidate had either post-secondary education with a focus in aviation, or a CFI certificate.[xxviii] This research seems to disprove claims by major labor organizations that low-time pilots "struggle to perform their flight duties proficiently."[xxix] Additionally, while HR 5900, now public law 111-216, mandated that by 2013 all airline pilots have 1,500 hours, the law concurrently allows the FAA discretion in formulating another model for qualification, though the FAA notes that they chose to deviate from some of the recommendations made by representatives of the flight training industry during the Aviation Rulemaking Committee (pre-NPRM process).[xxx] In consideration of such legislation, the FAA has acknowledged that changes to the CFI certificate privileges and limitations will likely ensue.

While it may be a convenient position to assume that it is the sole responsibility of the flight training industry to encourage the growth of the qualified pilot population, consider the massive annual investment in aviation infrastructure improvements each year. Clearly, the nation places a premium value on air transportation. In order for air transportation to remain a viable and efficient industry upon which the nation relies, stakeholders must become involved. The authors recommend a laser-focused and collaborative effort between all stakeholders, which includes but is not limited the Congress, the FAA, airlines, academic loan financiers, the flight training industry, universities and colleges. Efforts must be aimed at eliminating bureaucratic barriers and providing an effective and financially logical path to becoming a career pilot. In order to ensure that the supply of qualified pilots matches air carrier need, obstacles for qualified candidates in obtaining and using educational funding for flight training must be minimized.

Summary

There is no single solution to the predicted pilot shortage. The airlines, the FAA, and the flight training industry acknowledge the problem, but policymakers continue to ignore it.[xxxi] Even the FAA has acknowledged the need for "creative approaches to pilot training."[xxxii] Interim solutions may necessarily encompass reductions in service to match a sustainable level of qualified airmen, finding service alternatives if domestic carriers cannot provide a level compatible with demand, and developing a training process that is cost effective and may differ from current proposals, but that also meets the skill level and competency required of the airline environment. None of these solutions include leaving the system as it is currently. If forecasts about the pilot shortage come to fruition while licensure rates continue to decline, change will be inevitable for the flight training industry.

Innovative proposals have circulated within the flight training community with recommendations for resolving the difficulties of funding by developing a process by which candidates for federal or external funding of training are pre-screened for success. To create a workable financial model for financing of pilot training, stakeholders will need to create a system that has a success and payback ratio that is manageable for lending institutions or governmental based funding. Candidates that cannot meet screening qualification standards would simply have to find other sources or provide self funding if they wish to pursue professional pilot careers.

The non-flying public, not being well versed in the intricacies of flight training environment despite their proximity to recent legislation, continues to lobby policy makers to increase experience for flight crewmembers. If the flight instruction community has much work

to do, so too must the whole industry reconsider the sources of qualified pilots. Pilot training programs must be both efficient and cost effective, facilitating the growth of a group of qualified airline pilots, while meeting the public expectations for safety and cost availability in services.

In the effort to develop source points for qualified professional pilots, the aviation industry as a whole cannot look to the flight instructor community to provide the experience required to fill cockpit seats in commercial aircraft. Such a model makes the CFI community a less experienced group of pilots who are providing the training for our future career aviators, and undermines the purpose of the very legislation aimed at improving the standard of training. The flight training community must develop the path so that flight instructors become providers of high-quality, not just bare minimum, training. The industry must approach flight instructors as the professionals who educate pilots, not just a career placeholder to bide time and build experience.

Appendix A

A55_ActiveUSPilotsByAge
PROD

AIRMEN CERTIFICATION SYSTEM
ACTIVE US PILOT TOTALS BY AGE GROUP

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AGE GROUP	TOTAL US PILOTS	ATP	COM	PVT	REC	SPT	STU	ROTOR RATING	GLIDER RATING	BALLOON RATING	CFI
14-15	179	0	0	0	0	0	179	0	0	0	0
16-19	14,871	0	297	3,193	4	25	11,352	103	142	6	37
20-24	60,794	158	12,718	17,201	30	56	30,631	1,506	421	58	4,326
25-29	66,858	3,319	23,078	16,514	8	73	23,866	4,416	658	122	10,315
30-34	53,978	9,422	15,065	14,567	8	112	14,804	4,211	903	166	10,445
35-39	55,958	15,404	12,055	16,699	9	140	11,651	4,701	1,290	269	10,124
40-44	63,221	21,392	11,173	20,309	13	252	10,082	5,407	2,035	456	10,940
45-49	62,065	24,607	10,281	21,549	10	472	5,146	5,709	3,477	909	10,154
50-54	68,964	24,650	11,299	27,821	28	653	4,513	5,568	5,219	1,489	9,596
55-59	64,174	19,044	11,992	29,250	31	705	3,152	4,839	6,961	2,309	9,208
60-64	53,784	15,013	12,497	23,758	27	575	1,914	5,403	7,211	2,537	8,832
65-69	34,350	7,484	9,780	15,647	19	349	1,071	2,713	5,904	1,541	6,135
70-74	15,652	3,070	4,630	7,298	8	181	465	1,232	1,042	96	3,473
75-79	8,038	1,262	2,642	3,850	11	75	198	600	579	52	1,826
80&UP	4,702	639	1,593	2,352	9	14	95	223	426	26	1,062
TOTALS	627,588	145,464	139,100	220,008	215	3,682	119,119	46,631	36,268	10,036	96,473
AVG AGE	44.2	49.4	44.2	47.6	50.8	53.8	31.4	47.0	55.7	56.3	46.4

Federal Aviation Administration

About NAFI

The National Association of Flight Instructors is an association of members who work at flight schools, universities, FBOs, corporate flight departments, in the military, and as independent instructors. NAFI was founded in 1967 and its members, who teach in 17 countries, are dedicated to promoting and maintaining the professionalism of flight instruction.

NAFI members influence active pilots training to advance their skills with new ratings or certificates and students working to become pilots. NAFI staff works with industry and governmental agencies, serving as a voice for flight instruction community.

NAFI is not only the largest national association that serves the full spectrum of the flight instructor community. NAFI recognizes that flight instructors are truly the "teachers of flight" as well as the front line for "quality control" in our aviation world.

About the Authors

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