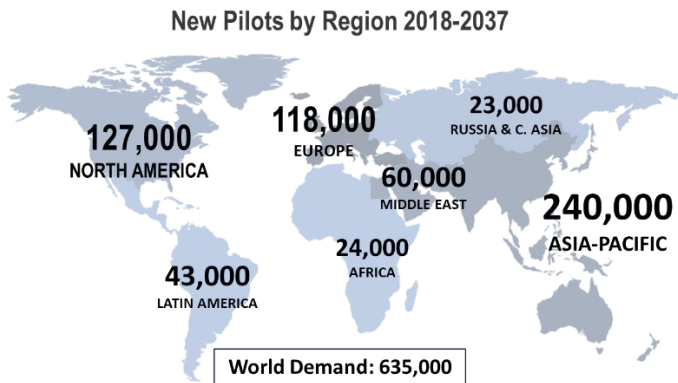


Business Environment Update | 2018

Is there a looming airline pilot shortage?



The [2018 Boeing Pilot & Technician Outlook](#) forecasts a need for 635,000 new commercial pilots over the next twenty years. With 295,000 active commercial pilots today, this is double the current workforce. The number is daunting, but only represents a 6.2% CAGR over the twenty year forecast period. So, what's the verdict? Is there a looming commercial pilot shortage?



Why is there an unprecedented demand for pilots?

Over the next twenty years, the global fleet will increase from 24,400 to 48,540 airplanes. Fleet growth rates have been especially high in emerging markets that have a comparatively small pilot pool. This has created regional supply challenges and caused airlines to look outside of the local market for qualified, ready-to-fly pilots. In addition, the airline industry is in its tenth consecutive year of above average air travel demand growth, creating an urgency for airlines to quickly hire pilots and put new airplanes into revenue service. These two factors combined have resulted in an unprecedented demand for new pilots.

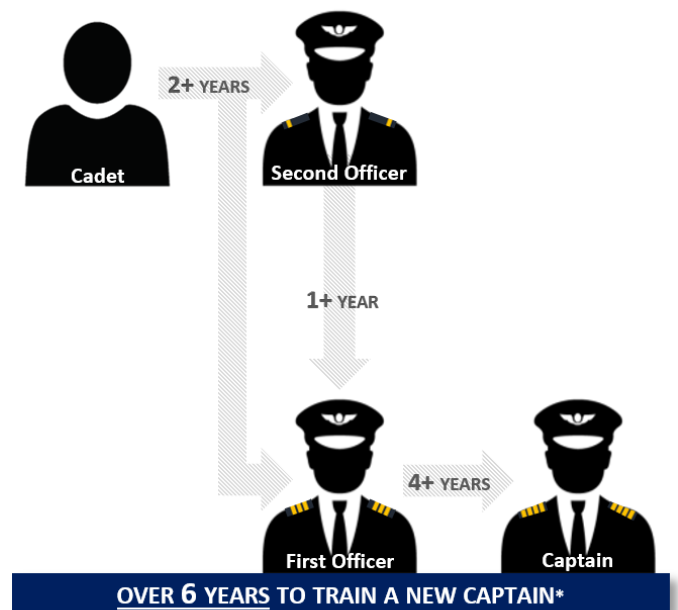
Okay, so what?

The pilot labor supply has continued to tighten amidst strong global air traffic growth, leading to staffing challenges for airlines around the world. Impacts ranging from flight cancellations to route eliminations and even bankruptcy filings have been cited. These

often isolated incidents have raised concern in the industry about the existence of global pilot shortage.

There are several key factors driving the debate: new pilot recruitment challenges, insufficient training capacity, aggressive captain recruitment, and retirements.

Airline Pilot Career Progression



*based on minimum requirements of a typical commercial operator and can vary by regulatory authority

New pilot recruitment challenges

When it comes to recruitment, many airlines are facing challenges in attracting qualified candidates, managing attrition, and developing a robust talent pipeline for the future.

The pilot training business model has changed from decades ago, when it was common for airlines to absorb training costs. Today, the burden has largely shifted to the student. The training required to qualify to become a first officer of a commercial jet can easily exceed

\$150,000, which can be a significant deterrent to aspiring pilots. Some airlines have implemented training bonds, where the airline pays for training on the condition that the pilot remain with the airline for a set number of years after completion. These types of business models can resolve a cadet's financing issues and ensure a return on investment for the airline.



In the United States, the general aviation and military sectors have historically supplemented the commercial pilot pipeline. However, the enactment of the 1500 hour rule in conjunction with defense budget cuts have significantly depressed the number of qualified applicants. To increase interest in the profession and attract top talent, regional airlines and low cost carriers have more than doubled starting first officer salaries from \$20,000 five years ago to over \$50,000 plus signing bonuses today. Flow-through agreements have also been established between many regional and mainline carriers to better manage attrition and provide a defined career path for new pilots.

Some airlines have started experimenting with broadening minimum requirements to increase the number of pilot applicants. However, there can be a financial cost to hiring less qualified pilots, as it often leads to increased training times and failure rates. There are thousands of unemployed pilots worldwide, but as airlines evaluate their business case, the lengthy and high cost of training out-of-practice or unqualified

pilots may outweigh other alternatives in the short-term.

Insufficient training capacity

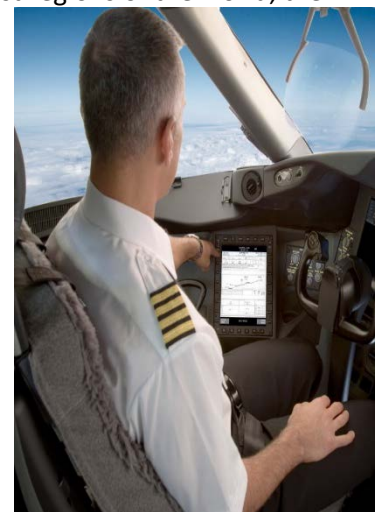
In many emerging markets, training infrastructure has failed to keep pace with growing air travel demands. These regions lack sufficient training capacity and rely on outsourced training, which can create a cascading effect and strain capacity in other regions of the world.

As an example, China has made significant progress in increasing its in-country flight training capabilities. However, even at full capacity, fewer than 2000 pilots can be trained domestically each year compared to over 5000 new pilots needed annually. Many aspiring pilots are sent to CAAC-approved training facilities in other countries.

Although airlines and third-party training providers have been investing in new training facilities around the world, it is a long-term solution. Flight schools produce new first or second officers, who then need to fly for at least several more years before they can qualify to be promoted to a captain.

Aggressive captain recruitment

While new first and second officers can be trained reasonably quickly in most regions of the world, the time required to develop qualified captains has been a significant pain point. Airlines in regions with high fleet growth rates are continuously taking delivery of new airplanes and need an interim solution while an indigenous supply of captains are trained and developed.



The short-term solution is to hire existing captains at higher salaries than other competitors while the airline builds a future talent pipeline. However, this creates a

ripple effect as other airlines do the same, until it reaches an airline that is unable to match salaries. The extreme mobility of the pilot workforce can create struggles at airlines and in regions that may otherwise have had an adequate supply of labor.

Retirements

On top of the demand for new pilots to support fleet and traffic growth, several regions of the world also have a large wave of pilots approaching mandatory retirement age.

Airlines in Japan and the United States received a reprieve when regulations were updated to increase the mandatory pilot retirement age. However, these updated regulations provided only temporary relief.

In the next five years, airlines in the United States will lose over 8000 pilots to retirements, or over four pilots per day. In addition to replacing retiring pilots and managing attrition outflow, these airlines will also need to hire new pilots to support fleet growth.

In Japan, over 50% of airline captains are over the age of 45, and a wave of retirements are expected starting in 2030. The time required to develop a new, qualified and competent captain cannot be underestimated.



What is the industry doing about it?

Increased wages and signing bonuses are a start to attracting and retaining existing pilots, but the key to mitigating a global pilot shortage lies in developing the next generation of pilots.

Airlines and third party training providers have invested millions of dollars in new training facilities. Training classrooms and curriculums are being advanced to include online and distance learning modules, interactive aircraft simulations, and real-time analytics that can pinpoint students' learning difficulties as they arise.



Ab initio flight training programs have also gained popularity as a way to develop a steady talent pipeline. These programs take cadets with little to no flying experience and train them to become a qualified first officer. Partnerships between airlines, flight schools, and third-party training providers have also become more common as airlines seek early access to top graduates.

Meanwhile, airlines have appealed to local governments for regulatory relief, which have come in the form of lower flight hour requirements, a higher mandatory retirement age, and a longer notice period before pilots can quit an airline.

Results from the efforts underway today will become more apparent within the next decade.



In recent years, the commercial aviation industry has experienced regional shortages driven by high fleet growth, insufficient training infrastructure, attrition, and other challenges. The industry is taking steps to build up a supply of qualified talent around the world and, over the long-term, market forces will fix supply-demand imbalances. In the short-term, however, we are likely to see localized disruptions as the industry works to implement new solutions.

For information on how Boeing is innovating and addressing the industry's global training demand, visit the [Boeing Flight Operations Solutions](#) page.

Why should we care?

Small cities and airports are at risk of losing regular air service, and travelers are likely to see airfare price increases as airlines are challenged with rising labor costs.

According to the Regional Airline Association, regional airlines are the only passenger air service provider at 64% of airports in the United States. Route cancellations due to pilot shortages can hit these communities particularly hard. Between 2013 and 2016, eighteen airports lost passenger air service entirely and 62% experienced schedule reductions of 10% or more. This sector of the industry plays a vital role in enabling regional and global connectivity.

Downstream, other sectors of the aviation community continue to be impacted. Business aviation operators have seen a significant increase in attrition rates as airlines entice pilots with higher salaries and a more predictable work schedule. The defense sector in several countries has also experienced a large outflow of aviators, leading to discussions about mandatory recalls, training outsourcing, and increases in signing and retention bonuses to quickly fill and train the open positions.

