

Introduction

Indian aviation has once again resumed its strong growth trajectory, with double-digit expansion since July 2009. This is good news for India's airlines and airports after a turbulent couple of years, but growth brings its own challenges. The need for high quality infrastructure is widely recognised and billions of dollars have been invested, and will continue to be invested in this area.

Simultaneously with rapid growth, the regulatory framework is being modernised, and implementation of these more stringent standards will bring its own execution challenges. Ultimately, the ability to bring India in line with the global aviation community will hinge upon the skills and competency of the workforce.

However, education and training appears to be the Cinderella sector in aviation - frequently neglected despite being absolutely fundamental to creating a professional, sustainable and safe industry.

Education is key to India's future success in all endeavours. The government is increasing expenditure in this sector and is encouraging private sector participation. Indeed, Kapil Sibal, Minister of Human Resources and Development, has suggested that investment in the education revolution could be even greater than was seen during the liberalisation of telecoms.

Certainly the thirst for education could not be clearer. More than 250,000 Indian students go abroad to study at any one time, making them one of the largest overseas student populations in the world, spending an estimated US\$26 billion. Indians, for example, form by far the largest international contingent at Embry Riddle Aeronautical University, one of the world's leading aviation and aerospace higher education institutions.

And yet, when developing a vision for the future, the aviation industry often seems to forget to plan for people. As we set out in this report, not only is a vibrant, world class education and training sector essential for safety and efficiency of Indian aviation, but taking one step further, India has the potential to develop as a low cost, but high quality aviation training hub for the wider region of emerging markets across Asia, the Middle East and Africa.

The Growth Prospects for Indian Aviation

India has seen dramatic growth in the aviation sector since 2003/04. During these transformational years, domestic traffic has tripled and international traffic has doubled. And yet, despite this

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unprecedented expansion, the relative size of India’s market today remains relatively small.

Trips per capita in India remain low (0.04) even by the standards of other emerging markets, such as China (0.15), Brazil (0.25) and Malaysia (0.54). China’s domestic traffic is 5 times the size of India’s. The upside potential therefore remains huge, driven by strong economic and demographic fundamentals.

Comparison with Selected Markets

| | Population | Domestic Traffic | Trips per Capita | GDP per capita |
|-----------|---------------|------------------|------------------|----------------|
| Australia | 21 million | 50 million | 2.38 | \$38,100 |
| USA | 307 million | 650 million | 2.12 | \$46,900 |
| Malaysia | 26 million | 14 million | 0.54 | \$15,200 |
| Brazil | 199 million | ~50 million | 0.25 | \$10,200 |
| China | 1,339 million | 198 million | 0.15 | \$6,000 |
| India | 1,166 million | 44 million | 0.04 | \$2,900 |

Source: CIA World Fact Book; FAA, DGCA India, CAAC, Malaysia Ministry of Transport, BTRE Australia, ANAC Brazil. Traffic data 09/10 for India, 08/09 for other countries

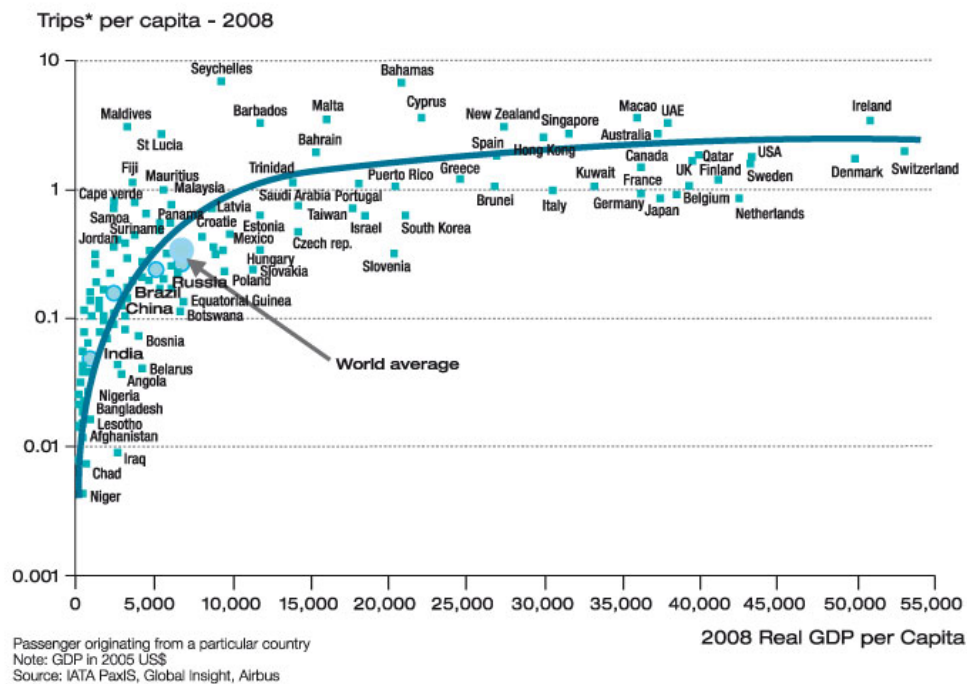
Economic, demographic and social trends are expected to provide continued support to the aviation sector over the long term:

- Strong GDP growth and a burgeoning middle class;
- Changing attitudes towards consumption as a result of increasing prosperity and influence from the internet and media. This is expected to result in an increase in the proportion of disposable income spent on leisure, entertainment and transportation;
- A relatively young society that will result in a large cohort of economically active people over the next two decades;
- High propensity to travel, as evidenced by the more than 600 million annual domestic trips – currently largely by slow and arduous surface travel alternatives.

“Based on projections for GDP growth, domestic air traffic could increase by 15% or more per annum until 2015”

Historically, GDP has been the strongest driver of air traffic and India is projected to achieve rapid and sustained economic expansion. In emerging markets, air traffic has grown at 1.5-2x GDP growth. With the Government of India targeting greater than 8% growth in 2010/11, and at least 9% for the next 5 years until 2015, this could drive sustained traffic growth of 15% or more per annum over this period.

Correlation between Trips and GDP per Capita



A number of global forecasts (eg. Airbus, Boeing and Airports Council International), project that India will be the fastest growing aviation market in the world over the next 20 years (albeit, off a much lower base than markets such as China), with a sustained compounded annual growth rate of approximately 10% per annum over this period. This would see India emerge as the 3rd largest aviation market in the world.

Airports Council International 20 Year Projections for Traffic Growth in Key Markets 2008-2027

| 2007 | | 2012 | | 2017 | | 2027 | | | | | |
|------|--------------------|-----------------------|------|--------------------|-----------------------|------|--------------------|-----------------------|------|--------------------|-----------------------|
| Rank | Country | Passengers (millions) | Rank | Country | Passengers (millions) | Rank | Country | Passengers (millions) | Rank | Country | Passengers (millions) |
| 1 | United States | 1,450 | 1 | United States | 1,552 | 1 | United States | 1,790 | 1 | United States | 2,345 |
| 2 | China | 297 | 2 | China | 497 | 2 | China | 792 | 2 | China | 1,708 |
| 3 | United Kingdom | 243 | 3 | United Kingdom | 282 | 3 | United Kingdom | 324 | 3 | India | 581 |
| 4 | Spain | 210 | 4 | Spain | 251 | 4 | Spain | 294 | 4 | United Kingdom | 409 |
| 5 | Japan | 204 | 5 | Japan | 228 | 5 | India | 274 | 5 | Brazil | 407 |
| 6 | Germany | 186 | 6 | Germany | 218 | 6 | Japan | 259 | 6 | Spain | 370 |
| 7 | France | 140 | 7 | India | 176 | 7 | Germany | 252 | 7 | Japan | 330 |
| 8 | Italy | 129 | 8 | France | 168 | 8 | Brazil | 224 | 8 | Germany | 311 |
| 9 | Brazil | 120 | 9 | Brazil | 165 | 9 | France | 192 | 9 | France | 242 |
| 10 | Canada | 101 | 10 | Italy | 154 | 10 | Italy | 180 | 10 | Italy | 233 |
| 11 | Australia | 101 | 11 | Australia | 131 | 11 | Australia | 154 | 11 | Australia | 209 |
| 12 | India | 100 | 12 | Canada | 125 | 12 | Canada | 147 | 12 | Mexico | 206 |
| 13 | Mexico | 85 | 13 | Mexico | 109 | 13 | Mexico | 137 | 13 | Canada | 195 |
| 14 | Turkey | 67 | 14 | Turkey | 92 | 14 | Russian Federation | 112 | 14 | Russian Federation | 178 |
| 15 | Korea, Republic of | 65 | 15 | Russian Federation | 84 | 15 | Turkey | 112 | 15 | Turkey | 157 |
| 16 | Thailand | 57 | 16 | Korea, Republic of | 78 | 16 | UAE | 95 | 16 | UAE | 152 |
| 17 | Indonesia | 56 | 17 | Indonesia | 71 | 17 | Korea, Republic of | 92 | 17 | Indonesia | 148 |
| 18 | Russian Federation | 52 | 18 | UAE | 70 | 18 | Indonesia | 92 | 18 | Korea, Republic of | 126 |
| 19 | Netherlands | 51 | 19 | Thailand | 70 | 19 | Thailand | 86 | 19 | Thailand | 125 |
| 20 | Hong Kong | 47 | 20 | Hong Kong | 61 | 20 | Hong Kong | 76 | 20 | Hong Kong | 113 |

These projections may even be conservative, particularly over the period through to 2020, during which the base will be lower and India will still be playing catch-up. CAPA projects that within the next 10 years, the domestic market will have grown to 160-180 million passengers (compared with approximately 44 million at present).

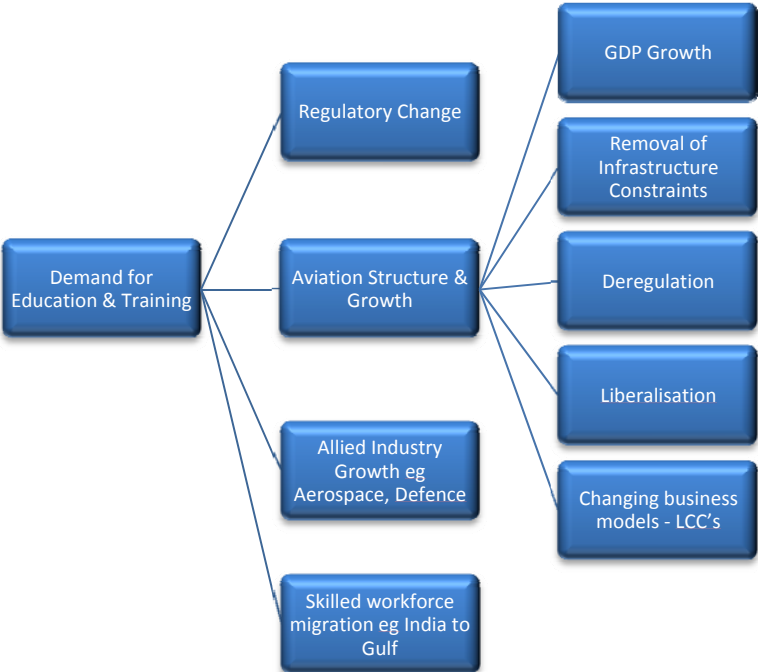
Managing this growth will involve numerous challenges, key amongst these will be maintaining and improving safety records, implementing quality management systems and addressing environmental concerns by finding a path to carbon neutral development. But the battle for human resources will be huge and it will be key to achieving sustainable growth.

The growth of the aviation industry will drive demand across every discipline including pilots, cabin crew, engineers, air traffic controllers, ground staff and handlers, administration and management. Each one of these roles requires training. This impacts not only airlines and airports, but every supplier across the value chain, as well as government regulators.

“The battle for human resources will be huge and it will be key to achieving sustainable growth”

And growth is but one of several factors that will drive demand for education and training.

Drivers of Demand for Aviation Education & Training



And this does not even take into account the impact on indirect employment, particularly in the tourism industry. IATA and ICAO for example estimate a multiplier of 4.8 indirect jobs are created for every aviation industry employee. In a market such as India where there is a greater reliance labour as opposed to automation, this figure may be even higher.

Training will be required not only to support growth, but also to address the impact of attrition, and more importantly to keep incumbent employees up to date with technological advances and regulatory developments. The industry will continue to see new airframe, engines and air traffic management procedures, particularly in light of the strong focus on fuel efficiency. These evolutions will require continuous training in investment without comprising on standards. In a fast changing environment, training cannot be a one-off activity.

And as India moves to the next level of regulation, in harmony with EASA and FAA standards, the quality of training required across the entire value chain will be need to be upgraded.

CAPA has developed some projections of the labour requirements for the Indian and Middle East aviation industries. These projections were developed by first constructing a forecasting model for the growth of traffic using regression analysis.

This was combined with a fleet forecast and assumptions for the number of pilots, cabin crew and engineers by different aircraft categories, together with attrition rates and adjustments for changes in productivity. Based on a scenario of average GDP growth of 8% for the period through to 2020, the projection for labour requirements in India is below. Indeed, our projections may even prove to be conservative.

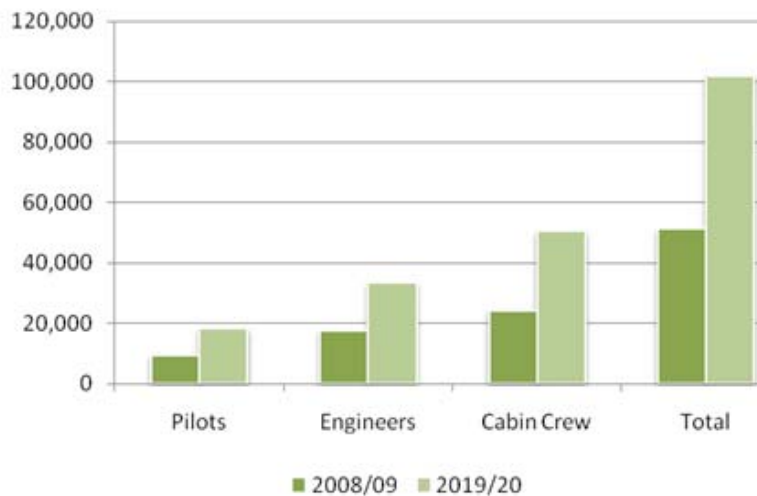
India's training capacity will need to more than triple in the next decade to keep pace with the level of growth because it could be argued that the infrastructure available today is not even sufficient to meet current requirements. If a cost effective solution is to be developed, the training must be delivered in-country and not offshore.

If the required scale, and more importantly the quality of training, cannot be implemented, then either the growth of the industry will be capped, operating costs will increase, or of much greater concern, we could have unsafe skies.

“As India implements regulations in line with EASA and FAA standards, the quality of training across the entire value chain will need to be upgraded.”

“If the required scale and quality of training cannot be implemented, then either the growth of the industry will be capped, costs will increase, or of much greater concern, we could have unsafe skies”

CAPA Research Projections for Pilots, Engineers and Cabin Crew in Indian Aviation



India was faced with the prospect of being downgraded to a Category II nation by the FAA in 2009, due to concerns about the shortage of experienced airworthiness inspectors. Due to the significant and concerted efforts of the Director General of Civil Aviation, with the support of the Ministry of Civil Aviation, the deficiencies were addressed quickly.

At this nascent stage of its growth, or indeed at any time, India can ill-afford an incident, and efforts need to continue to be made to develop a zero tolerance culture in the area of safety. Enhanced safety oversight and the implementation of safety management systems are necessary. Training is a key component of this, and foreign institutions (such as the FAA and the EU) are providing support in this area.

A severe capacity crunch may emerge sooner rather than later. We have seen strong double digit rates of growth in the domestic sector in recent months. This could very quickly lead to a return to a shortage of staff and wage inflation. In such issues there also needs to be forward planning as there can be a significant lead time involved in many roles – captains, air traffic controllers and engineers cannot be created overnight. Given the current growth trajectory, CAPA believes that skills shortages will resurface from 2012/13, if not earlier.

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General Aviation

And we have only referred to commercial aviation. The other major growth sector is business and general aviation, even though to date it is perhaps the most neglected area, having received limited attention from a policy perspective and with virtually no dedicated infrastructure.

Even in spite of these challenges, in mid-2009, India ranked 16th in the world in terms of the size of its business jet fleet, at 113 aircraft. It is in fact already the largest market in Asia, with more aircraft than either China or Japan for example, although it lags other emerging markets such as Brazil (403 aircraft) and South Africa (152).

Nevertheless, it is the expected growth rate that is quite dramatic. Amongst the 20 largest markets in the world, India has the highest ratio for confirmed business jet orders as a proportion its current fleet, followed by the UAE. On this basis, India will enter the ranks of the top 10 general aviation markets in the world within the next 5 years. And if the Very Light Jet (VLJ) segment takes off as is anticipated, the growth could be even more impressive – VLJs could be a game changer that could do to general aviation what LCCs have done to the commercial sector.

Yet the training facilities in the general aviation sector are virtually non-existent. Indeed, CAPA's research into this sector reveals that skills shortages are even more acute than in the commercial sector, which is having an impact on its development and safety.

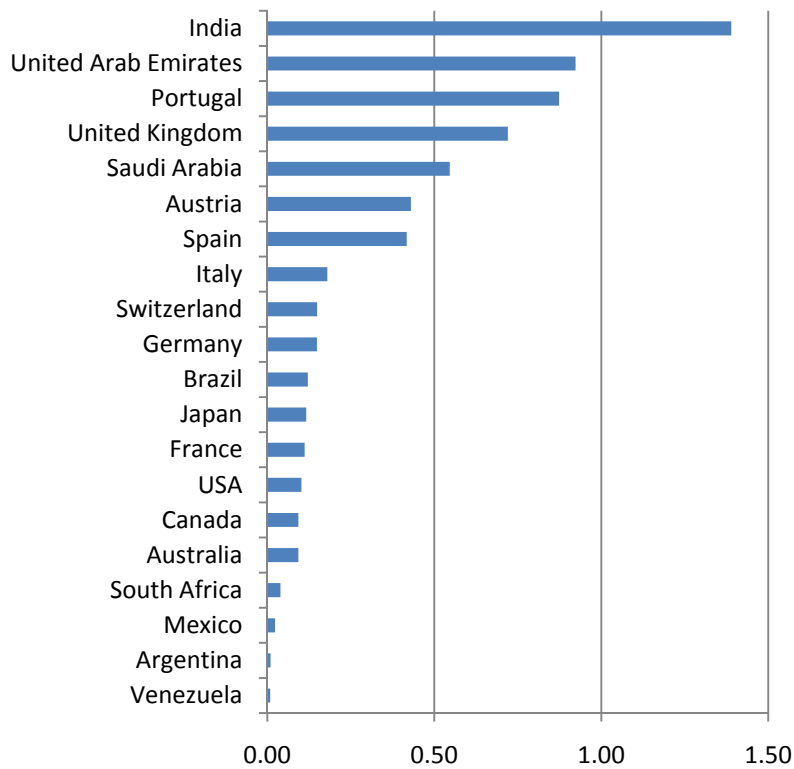
In 2008 for example, the last year for which accident investigation data has been released by the DGCA:

- there were six accidents;
- all of which occurred in the general aviation sector;
- three of which were fatal;
- five of which were assessed to have been due to pilot error and diversion from standard operating procedures, ultimately stemming from insufficient training.

The government has largely ignored general aviation and it has been left to the private sector to invest in the sector. However, limited investment has been forthcoming because of the absence of qualified personnel. As a result, India has yet to see the emergence of a serious, scalable operator in this space.

“Skills shortages in general aviation are even more acute than in the commercial sector. The impact on safety is reflected in the accident investigation reports.”

Confirmed Business Jet Orders as a Proportion of Current Fleet (mid-2009)



Source: CAPA, Ascend database

Competition from Other Markets

Indian aviation will not only face the challenge of training staff for its own requirement, but it will also compete with other industries (particularly service sector roles in banking, hospitality) and with other growth markets. This will intensify the battle for experience and quality resources.

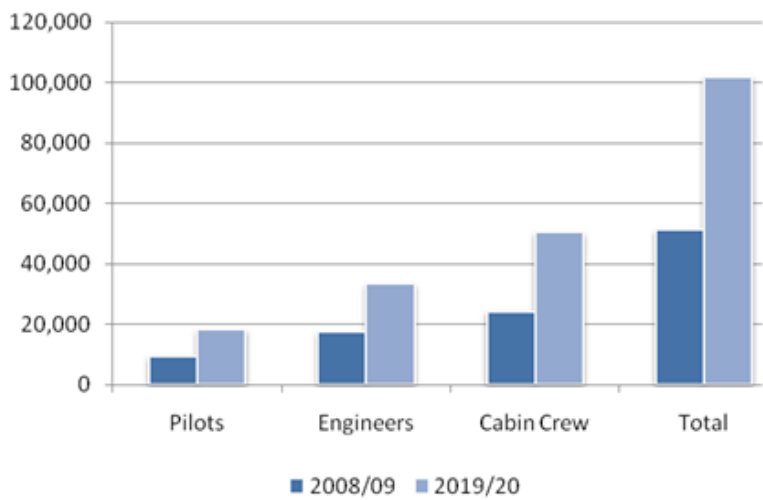
“Indian aviation will compete for staff not only with other industries, but also with other growth regions.”

Indians for example account for approximately 30% of the workforce in Gulf nations such as the United Arab Emirates. A large number are in the construction sector, but there is nevertheless a high proportion of Indians working in the aviation industry, particularly in airport services, administrative functions, engineering and cabin crew. By 2020, the number of pilots, engineers and cabin crew in the Gulf is expected to exceed 100,000 which will be slightly larger than the number in India at that time.

Aviation is strategic to the economies of the Gulf nations and people are necessary to support the sector’s expansion, which includes investment of over US\$40 billion in airport development and over

700 confirmed aircraft orders. Large scale recruitment from India is taking place today even in the absence of an established training infrastructure. The higher the quality of training that is delivered in India, the more likely it is that staff will be poached and hence training capacity will need to account for this displacement.

Projections for Pilots, Engineers and Cabin Crew in Middle East Aviation



If 20-30% originate from India, this will create a drain of 20-30,000 staff which the local training infrastructure will need to replace.

And cost will increasingly be an issue in the Gulf. The recent financial crisis in Dubai has resulted in a slight shift in commercial drivers, with an increased focus on budgets requiring more sustainable wage bills. India is geographically, economically and culturally best-placed to supply cost-effective, skilled resources to the Gulf aviation industry if a high quality, low cost training infrastructure can be developed.

“India is geographically, economically and culturally best-placed to supply cost effective and skilled manpower to airlines and airports in the Gulf.”

Centre of Gravity Shifts to Emerging Markets

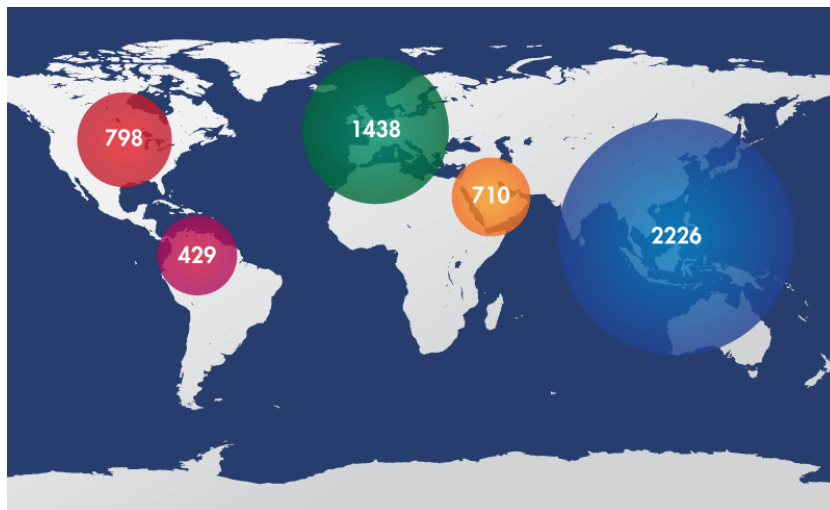
The growth that is being seen in India is reflective of the expansion of the aviation industry across much of Asia Pacific and the Middle East. Indeed, as IATA reported, intra-Asian traffic overtook North America in 2009 for the first time, to become the world’s largest aviation market.

Historically, global aviation has been led by North America, followed by Europe. Those regions, being mature markets with high base traffic levels can expect to experience relatively slower levels of growth in future. But even given this context, the FAA’s 20 year

forecasts released in March 2010, which project an annual growth rate of just 2.5% for US domestic and general aviation traffic between 2010 and 2030, appear highly pedestrian. The more dynamic markets of Asia and the Middle East are growing rapidly, and given their much larger population will sustain these growth rates for some time.

These next two pictures tell much more than a thousand words about the future of the airline industry and its growth profile. Some two thirds of the total global aircraft orders are for aircraft in the Asia Pacific and Middle East regions. This promises to place enormous pressure on skills in these regions.

Current Aircraft Orders by Region



Source: CAPA, Ascend Database

The difference between developed and emerging nations becomes even more stark when looking at only the orders for widebody aircraft – that is, aircraft that will mostly be used for long haul flying.

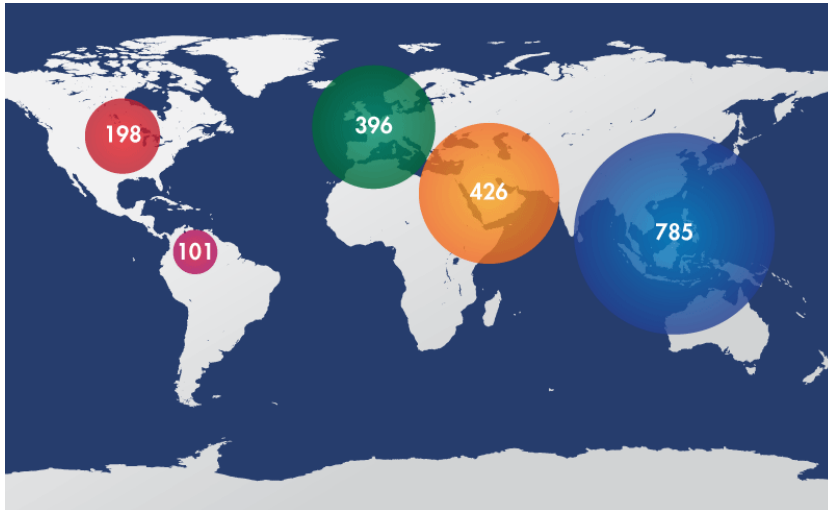
The shift in balance of power in long haul flying is the most obvious conclusion to be drawn from this. But it is also telling that the airport hubs of the future will be developed in Asia. Even allowing for more direct flying, as new aircraft like the B787 and A350 make this possible, along with greater liberalisation of access, there will be a natural tendency for concentration of flying around existing and future major hubs.

The implication of this is that the global aerospace industries have a great stake in supporting the growth of vibrant aviation sectors in emerging markets such as India. If this growth is to happen while

“With long term growth prospects slowing in mature markets, the global aerospace industries have a great stake in supporting the development of vibrant aviation sectors in emerging markets such as India”

ensuring safe skies, it is imperative that skills are developed as a key success factor.

Widebody Aircraft Orders



Source: CAPA, Ascend Database

As the Asian carriers spread their wings in this way, the range and nature of skills training and education becomes even more diverse, making for additional challenges for governments and industry in their efforts to provide adequate facilities.

What does this mean for Aviation Training?

In light of the above analysis, the need will be greatest in Asia and the Middle East, the regions which currently have limited existing training infrastructure. Although some of the issues and drivers may differ, the developed markets in North America and Europe also face their own challenges in attracting, training and retaining a skilled workforce. Some of the key issues include:

- **Training Infrastructure:** Most of the current training facilities are located in North America and Europe, but the greatest demand is in the emerging markets. This means that people in these regions are either being sent overseas to where the facilities (which is expensive), or are not receiving proper training (which is dangerous). Alternatively, key roles are being filled by expats, which is also not financially or culturally sustainable. There is a desperate need to develop high quality, in-country facilities where the demand is.
- **Harmonisation:** There is a critical need for greater harmonisation of international regulations to permit standardised training and enhance global mobility of labour.

“With long term growth prospects slowing in mature markets, the global aerospace industries have a great stake in supporting the development of vibrant aviation sectors in emerging markets such as India”

- **Role of Technology:** As technology becomes more pervasive in aviation, training needs to recognise this in the following ways:
 - Technology is creating new roles and changing existing ones – training must keep pace with these developments;
 - The youth of today are technology natives and not technology migrants, and if they are to be enthused about the industry, we need to engage with them in a manner which they relate to. This means greater use of technology in the delivery of training, rather than continuing to use old fashioned methods ‘chalk and talk’ methods.
- **Competency:** Training needs to evolve to become more competency and evidence based eg. the Multi-Crew Pilots Licence (ie. training should focus on how you will perform your role in the workplace – just as the military has always done). Competencies must be measurable and achievable.
- **Image of Aviation Careers:** In North America and Europe, aviation is struggling to attract high quality people amongst the next generation of students, who are increasingly being drawn to other sectors. The industry needs to address the very real problem that aviation is seen having lost its glamour – instead it is now seen as a stagnant industry, associated with shift work, declining perks, poor remuneration, and instability.
- **Competition from other Sectors:** There is a need to introduced outreach programs that target students not only at universities, but also at a much earlier age, in schools, to promote the attraction of a career in aviation. And it does not end there, once people are in the industry you need to retain them. The next generation is not as wedded to the concept of picking and sticking with an industry for the long term. Switching between sectors will become increasingly common. This in itself will increase the demand for training as staff turnover will be higher.

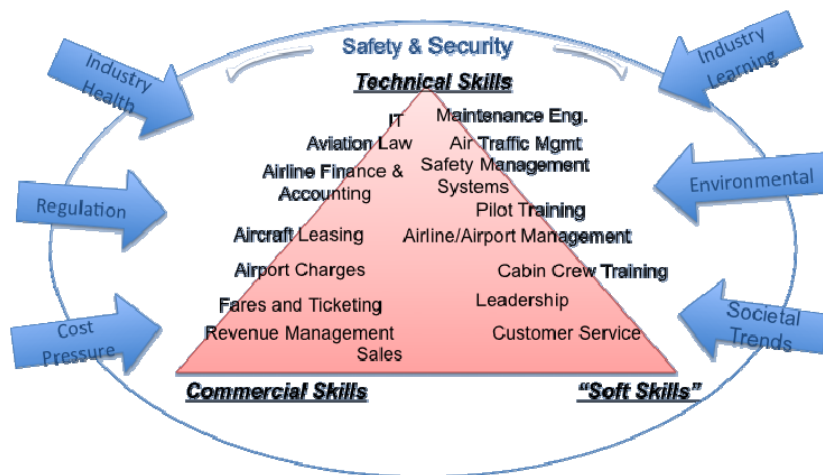
Aviation Training Pyramid

So why should companies invest in training? To improve safety and operational security? To deliver better customer service which will bring in more business? To impart technical skills? All of the above, but importantly, training is about preparing people to deal with uncertainty and the unexpected, whether it is a pilot at 35,000 feet

or a CEO looking at forward bookings or orders. This ability to deal effectively with what is around the corner is of paramount importance.

Aviation training covers a wide variety of skills and disciplines, from highly technical, such as IT or maintenance engineering, to 'softer skills' such as customer service or commercial knowledge in areas like revenue management.

The Aviation Training Pyramid of Skills



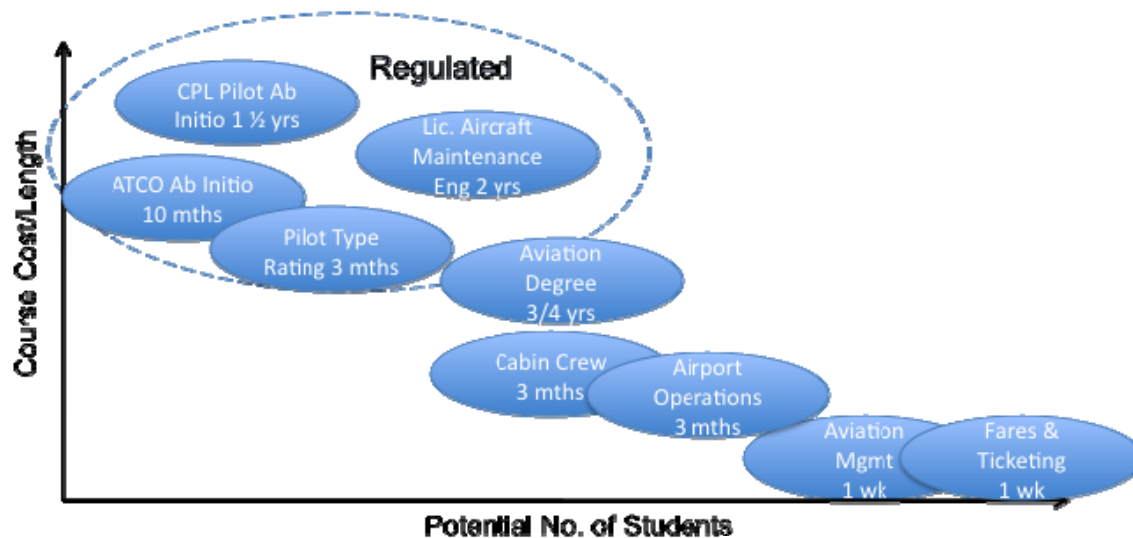
Training has evolved to become more a blended art. So for example, aviation law experts need to be commercial as well as specialists in legal matters, and pilots need to have leadership and management skills as well as the traditional skills of airmanship. The delivery of training itself is recognised as a specialist skill which even gifted technical experts may not be able to master.

Training requirements are affected by a number of external factors. For example, the financial health of the client aviation sector will be felt very directly by the training sector, albeit with a lag. And the introduction of changes associated with various carbon emission reduction schemes will ripple throughout all aspects of training from how aircraft are routed and flown to how carbon is accounted for across the business. How many "carbon accountants" will be needed in the next few years and where will staff acquire these skills?

The courses themselves stretch from vocational training in regulated areas such as flight operations, air traffic control or maintenance engineering requiring up to 2 years of study supplemented by 'on-the-job' experience, through to 3 year degree courses, and onto

short courses covering a broad range, such as dangerous goods, customer service basics, fares and ticketing to management subjects such as network planning, aircraft financing, strategy and leadership.

Aviation Training Covers a Diversity of Durations, Costs and Volume



Training Infrastructure in India

CAPA conducted an extensive review of aviation training infrastructure in India, consisting of site visits to 42 Aircraft Maintenance Engineering training institutes (out of 70 approved institutes in the country) and 33 flight training academies (out of 40). We subsequently interviewed senior management at the leading airlines and airports, to understand their opinion of the quality of graduates from these institutes.

Pilots: Overall, the quality of available infrastructure was found to be poor both in terms of the equipment and delivery of instruction. There were of course exceptions, the Rajiv Gandhi National Flying Institute in Gondia and the Indira Gandhi Rashtriya Uran Akademi in Rae Bareilly, have invested in modern training aircraft and simulators, providing exposure to a glass cockpit environment for ab initio students. However, many flight schools operate ageing aircraft, which are poorly maintained, which not only creates reliability and safety issues, but ill-prepares license holders to make the transition to modern jet aircraft. One large Indian carrier indicated that during type rating, holders of CPLs from local academies required up to twice the international average for the number of simulator sessions to qualify. Estimates suggest that up to 4,000 Indian CPL holders are currently unemployed, and possibly unemployable.

“A large proportion of CPL holders from Indian academies are ill-prepared to make the transition to modern jet aircraft.”

In the case of flight simulators, until 2009 there were no third party facilities available in the country. Air India and Jet Airways had in-house facilities, but for other carriers their only option was frequently to send pilots overseas, which could double the expense of training due to travel and increased time away from duties.

Engineers: Airlines and MROs indicated that the graduates of the AME training institutes have low employability because the focus of the courses tends to be on passing examinations rather than being job-ready, with institutes frequently having insufficient facilities to provide the necessary practical training in terms of access to equipment and aircraft. Addressing this issue requires greater cooperation between industry and training institutes. At present, the level of interaction is limited, with institutes struggling to even organise on-the-job training for students.

Operators also stated that current training only covers technical competencies, but that there is a need to also teach soft skills such as communication and team work.

Recognising the need to upgrade the training standards, the DGCA has issued a draft new Civil Aviation Requirement 147, which is largely based on EASA Part 147. The Indian CAR allows a maximum of 30 students for training courses (compared with 28 for EASA) but in other respects the regulations are similar in terms of requiring:

- comfortable classrooms with appropriate presentation equipment;
- basic training workshops with necessary tools, equipment and access to aircraft, engines, parts and avionics;
- secure storage facilities for exam papers and records;
- library with all required technical material;
- accountable management team, including one responsible for compliance with the CAR;
- independent quality auditing system

CAPA's understanding is that the majority of AME training institutes would not be approved if the draft CAR147 was in force today. In the assessment of a leading global MRO, perhaps 10% are in compliance with international standards.

“The majority of AME training institutes would not be approved if the draft CAR147 was in force today.”

If India had a strong MRO sector, with participation by leading global operators, there would probably have been greater upstream pressure to focus on the quality of students. Instead, airlines have generally followed a long apprenticeship model, with engineers

achieving their licence after several years of on-the-job training. This may have worked in the past, but this approach will simply not generate the volume of engineers that will be required to support the projected growth of the industry.

Cabin Crew: With respect to cabin crew, academies have mushroomed across the country in recent years, but airlines state that whilst they teach some basic grooming and communication skills, most of them do not have equipment such as fire simulators, door trainers for multiple aircraft types, slides and ditching pools to be able to deliver regulated safety and emergency procedures training. This ultimately places the responsibility and the costs back on the airline.

Air traffic controllers: India currently has approximately 1,600 air traffic controllers, as against a sanctioned strength of 2,200, representing a shortfall of 600 even today. Not only will India have to manage the growth related its own air traffic movements, but its strategic geographic location means that it lies on the overflight paths to/from the other fast growing markets of Asia and the Middle East.

The Airports Authority of India (AAI) has a dedicated college at Allahabad and an additional facility at Hyderabad, but significant investment is required in order to update equipment and install the latest simulation technology. Using less advanced training and operational methods means that India currently mandates separation minima higher than the international average, thus reducing the efficiency of available airspace.

There is a need to increase the capacity of the current training facilities not only to keep pace with the expected growth, but also to provide recurrent training for existing controllers, given the very significant investment that the AAI is making in modernising equipment and operations under the Future Indian Air Navigation System Masterplan, including the introduction of Performance Based Navigation, ground and satellite based augmentation systems and upgraded controller tools.

Management: Indian aviation currently has limited depth in its management structures simply because most of the positions did not even exist just seven years ago when the industry was one-third its current size. And this is an industry, which given its complexity and volatility, is one where management capability is critical. There are

literally just a handful of degree programs currently offered in aviation management, and teaching is often theoretical in nature.

But as airlines and airports informed us, it is not just management skills that are missing in the industry, white collar roles across the entire business as diverse as fleet planning or yield management in airlines, or retail operations at an airport, all require training. Given the shortage of qualified people, positions are often held by executives who through no fault of their own simply do not have the skills to maximise their performance.

Expatriates have been recruited for several senior management positions, although this has not been an entirely successful exercise, with cultural and environmental issues resulting in several early departures. There is a case for bringing in international expertise in certain cases, but in the long term India cannot rely on expat management, it must develop local talent.

Aerospace Engineering: In addition to civil and general aviation, India has great potential as an aerospace hub. The country's large pool of science and engineering graduates, strong IT capabilities and relatively lower salary levels make it potentially an attractive location for aerospace research and manufacturing. India has made great strides in automotive components manufacturing and assembly for example.

A further key driver is the impact of offset spending from government civil and defence contracts, which require up to 30% of the contract value to be spent in-country. This can consist of JVs, direct licensed production and maintenance agreements; R&D and University Initiatives.

Currently USD2.6bn of offset commitments created by Air India and Indian Airlines aircraft and engine purchases from Airbus, Boeing, CFM and GE, and over the next 5 years the offset obligations associated with both defence and civil contracts are expected to reach US\$10-15 billion.

Indian companies are gearing up to meet this demand, but a skilled workforce is a key requirement. Aircraft and original equipment manufacturers have stated that the shortage of skills is restricting their ability to invest, which in turn is preventing large segments of the population from being part of India's growth story. Other obstacles include a punitive fiscal regime and a need to enhance the culture of quality – aerospace adopts a zero tolerance position.

“Aircraft manufacturers and OEMs have stated that the shortage of skills is restricting their ability to invest in India”

A Clear Opportunity

The government has demonstrated a very clear willingness, supported by action, to invest in upgrading the training environment in India, and to collaborate with the FAA and the European Union on key issues. However, the concern is that the pace of change is likely to be so rapid as growth resumes, that dealing with day-to-day issues may distract from the longer term vision. There is a clear need to move with urgency.

But it is not a matter for government alone. In fact, apart from air traffic controllers, aviation training is largely private sector led so industry also has to take initiatives. Training may be an ideal area for public-private partnerships since safe, efficient air transportation is good for business, but also has positive externalities by maintaining the competitiveness of the Indian economy.

The government took a positive step in January 2008 when the foreign direct investment cap in flying schools and training institutes was increased to 100%. But international training providers still report frustration with difficulty of doing business in the country. Tales of negative experiences make others cautious about entering.

In the next 10-20 years, India will be one of the leading aviation markets in the world, one which cannot be ignored, a development which will require billions of dollars of investment. But to attract capital on this scale, quality and safety must be a central tenet which is impossible without skilled people.

There is a need for a fundamental overhaul of the quality of training in India and it must happen quickly and in a cost effective manner. But if India succeeds in this mission, it will in the process create a massive export opportunity. There exists the potential for India to become a low cost, outsourced aviation education and training centre for the world, provided that international quality standards can be established.

This infrastructure could be further leveraged through the use of technology to deliver courses worldwide through e-learning platforms. This is particularly so since the global aviation training market is relatively fragmented with inconsistent standards. India can take a leadership position and work with the regulators in key markets to deliver courses that are recognised in multiple jurisdictions to facilitate global mobility.

“To attract capital on the scale required in Indian aviation, quality and safety must be a central tenet, which is impossible without skilled people”

“There exists the potential for India to become a low cost, outsourced aviation education and training centre for the world”

Not only could India provide training for global industry, but it could also provide the manpower. This is already the case in the Gulf as we have seen, but there may also be an opportunity in developed countries where a large proportion of the workforce is approaching retirement in the next 10 years and the attraction of the industry for the next generation is waning.

The fact that India is a late starter allows it to leapfrog outdated forms of training and move directly to cutting edge formats which are attuned to the next generation, and which more accurately reflect the level of technology involved in actual aviation roles ie. a move to more competency based training. India has the luxury of starting from a virtually clean slate and the potential to design the ideal training infrastructure for the industry of today and tomorrow.
