RESEARCH PROJECT ON

(A STUDY TO INVESTIGATE THE IMPACT OF AIRLINE ROUTE DEVELOPMENT ON AIRPORT COSTS)

FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF

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UNDER THE GUIDANCE OF:

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EXECUTIVE SUMMARY

The research report is based on the route development in India and how the airline route development impact on airport cost. The research report first describes all about the route development and it's needs to the reader, to critically understand the basic concept behind the routes and route development.

Then, the reader would separately understand the route planning of airlines and airport route development. With clear understanding of what exactly is route planning meant and its importance for both airlines and airports, we will then understand about route development in India. This we would let us understand the significant changes that the country is opting in the field of aviation industry, and it will make India the world 3rd largest Aviation Industry.

In the Literature review, the report has mentioned about the work done by various researcher on the topic, to provide the reader with its outcome of there research. In the latter, which is research methodology, both qualitative and quantitative methods have been used, and source of my data is all secondary. In qualitative part, the informational is theoretical and in quantitative part, its statistical information.

Then, analysis of all the information and its results have been mentioned at the end. The research is solely, dependent on the secondary sources, but is more organised to reach to a specific conclusion. At last, the summary of the report has mentioned about all the work of the report. The report has also done proper citation of the sources and references are also mentioned at last of the report. In the end declaration of mine with certificate from the mentor faculty is also provided.

INTRODUCTION

India is one of the fastest growing aviation industries all around the world. By 2025, it is predicted that it's going to be the third largest aviation industries all around the world. And to make it possible, there are various new developments are being taken by the government. The development of near about 200 new airports are under construction, and also new infrastructure development are being done at the existing airports as well. This has led to the emergence of thousands of new routes in India. The report provides will determines about the route development in India.

OBJECTIVES UNDER STUDY ARE:

- Understanding of route development
- Fundamentals of route development
- Airline route planning
- Factors affecting airport route development
- Impact of airline route development on cost of airports

LITERATURE REVIEWS

The route development is an essential function for airports planning to attract new services. Based on the demand and revenue estimation, and on fleet type availability, the flight frequency and seat capacity can be determined, and, accordingly, cost estimation can be performed crucial for route implementation. Based on the estimated revenue and cost of the route, the airlines decide about the particular routes. (source: Ahmed Abdelghany, Ph.D., Associate Dean for Research at David B. O'Maley College of Business).

The research done by (martin 2009) on the 41 small hubs and non-hubs airports in US determine that eighty percent of the airports stated that they used route development techniques to retain their services and 70 percent declare that they used it add new destination or new frequency of operation at the airports. Around 60 percent used it reduce fares. (source: authors; Nigel Halphern and Anne Graham).

The research done on the route development is so far optimistic around the world. In India there are various reforms and policies are being enacted by the government of India to promote regional connectivity through airports. There is not much research done to analyse the previous and present route development costs in India. With the development of 200 new airports and its importance, the area under study is to understand what is the government support to reduce the overall costs for the airports and how it is going to attract the airlines to operate at these airports.

STRAIR (2005) divides the objectives into two types, namely those related to connectivity (number of destinations served, frequencies and capacity) and those related to traffic (number of passengers arriving, departing and transiting, cargo value, weight and volume). The type of service being targeted may also vary considerably. It can be considered by airline (e.g., mainline, low cost, regional, leisure/tourism charter,

private/business charter) or destination (e.g., domestic, international within the same world region, intercontinental). In addition, cargo flights can be specifically targeted but, as de Haan (2012) argues, this can be more challenging because of the different markets and airline business models, together with the relatively poor quality of data. Depending on the nature of the airport operator and the relationship with stakeholders in the surrounding community, there may be broader and complex objectives related to wider benefits for the region such as the development of tourism or improved connectivity for businesses or local residents. {SOURCE: Westminster research}

ROUTE DEVELOPMENT

Route development is an essential function for airports planning to attract new services. It is also a core function of airline planning that aims to expand airspace networks and/or shift resources to better opportunities. {SOURCE: Ahmed Abdelghany}

RULES OF ROUTE DEVELOPMENT

- **UNDERSTANDING YOUR MARKET:** It is important to understand YOUR market – you cannot target everyone, which is why you need to focus. Understanding the market starts with trying to quantify it. The number of passengers between any two points will be a fraction of passengers either travelling indirect via another airport or potentially through surface leakage. Make sure you understand the direct/indirect split and surface leakage. {source: ASM network} Quantifying the market could involve aspects other than hard and fast passenger traffic volumes. This will help segment the market and understand where the passengers will come from.
  The following indicators are all valuable sources of data to help describe your market:
  Economic and social indicators: - Corporate travel potential: how many people, how often and currently who with? - Employment sectors: e.g IT, pharmaceuticals, finance - Forecast economic growth rates - Commercial/economic ties: with target route destination - Main exports/imports: trading partners - Population trends Tourism indicators - Origin/nationality of visitors - Number of bed nights - Understanding source markets - Unique leave patterns - Events, festivals, places of interest - Demographics: ethnic ties generate visiting friends and family (VFR) traffic. {sources:PATA,} WTO, your local tourism board As well as this, be sure to include projections on yield, seasonality, directionality and leakage – surface or carrier. A traffic forecast is essential. A forecast will help you access the market and give your pitch credibility as well as demonstrating that a scientific approach has been taken to show that the opportunity is viable. For network carriers in addition to beyond/behind passenger forecast detail is relevant.

- **UDERSTANDING YOUR CUSTOMER:** Understanding your competition is essential. Which airports are in your catchment area and which airports / destinations are your competitors in different market segments: FSC, LCC, Charter, Cargo and regional scheduled carrier. It is important to monitor your performance against your competitors and to understand your competitor's route

development activities, pricing and product. Who are airport's competitors? • First and foremost, other airports - whether they are local, national or international, these are an airport's most direct competition as they may be able to offer your customers a better location or a better cost. Their offering, location or amenities could be superior to yours, and the strength of their based carriers must be considered. • Other transport options – such as rail, road, ferry or coach. Your airport is in direct competition with these modes of transport because they might be more convenient for your potential customer, or they could be more cost effective. The speed in which the customer can reach their destination will also be considered. • Competing stakeholders – like tourist authorities or regional government. These competitors are in a position to offer a better market, they have ASD resource strength, and they have access to funding. • Communications technology – be it conference calls, Skype, FaceTime and other communications platforms. Advances in technology have the potential to reduce the requirements for travel. Compare your market size by addressing what your largest unserved markets are, as well as the largest unserved markets of the competition choices for the airlines. The average fares of your carrier should also come into account: look at how the average fares in your market compare to others in the region and the others in the airline's network. In understanding its competition an airport and destination should have insight into its market position and where it ranks. It is important to develop a clear, credible position and brand to deliver success in an increasingly competitive industry. {source: ASM NETWORK}

- **UNDERSTANDING YOUR CUSTOMER:** As an airport or destination your most important customers are the airlines and tour operators that serve your market, bringing in passengers and visitors to your market. There are a number of different airline business models that have varying needs, from full-service carriers, charter airlines, low-cost carrier airlines and ultra-low cost operators. As the aviation market has developed so airlines have developed hybrid business models to segment the market. Each airline or tour operator will have different needs in terms of market, financial and operational requirements. Understanding the airline involves understanding; fleet / network / scheduling priorities / operational requirements / financial support / market fit / geographical fit / brand strength in the market place. Decision making processes differ from airline to airline. Some decisions always go to the Board, for other carriers the network development team will make the decision. Understanding the perception of the carriers have of your market can be tested through a simple questionnaire. {source: ASM NETWORK}

ROUTE PLANNING

Route planning is the process of identifying and evaluating the feasibility of new routes for an airport by a given airline. Recently, some numbers have been shared on the success rates of new routes. This rate is defined as the percentage of newly developed routes that remain in service one or two years after inauguration. As this rate increases, it indicates that the airline has the capability to properly anticipate new route performance in the short term. One would expect that this rate is on the high side, given that most airlines deploy internal and external consulting resources to study route feasibility before their deployment. Unfortunately, this has not been the case.

For several low-cost carriers in the U.S., for example, this rate was in the range of 50-70 per cent, meaning that in the best-case scenario, about 30 per cent of new routes fail. Given the costs and investments associated with developing and deploying new routes, it is uneasy for an airline to have too many failing

routes. Understandably, airlines and airports want their businesses to grow. One common mistake among planners is that they rely more on wishful thinking rather than market reality, resulting in a tendency to be over-optimistic in developing route plans. {source: AHMED ABDELGHANY}

Determining route feasibility {source: Ahmed Abdalghany David O' Malley College}

Studying route feasibility is mostly performed using a systematic ad hoc calculation process. This process is mostly data driven, relying on estimation and forecasting methods to guide decision makers on the expected performance of routes.

- ### Identifying the route

The first step of the process is pertinent to naming the route to be investigated. As the airline size and the diversification of its fleet increases, one would expect that there are an enormous number of routes that can be investigated as new additions to its network.

Airlines that adopt hub-and-spoke network structures typically start and end routes at their hub. On the other hand, point-to-point airlines extend services from any of their current destinations. Airlines need tools that continuously scan all routes and identify a subset that is worth going through a detailed feasibility study. This scanning mechanism should be able to identify the routes that the airline is authorised to fly and have, or could have, the appropriate slots at the origin and destination airports.

This identified route could have one or more of the following characteristics: Capacity-underserved during one or more of the seasons, have potential demand growth, fits in the airline's network structure and business model, fleet compatibility, have potential to stimulate new demand, may attract demand from nearby major airports if any, have cargo revenue, is cost effective, and have premium yield. The lack or inaccuracy of this tool to shortlist potential routes may easily result in an opportunity loss for the airline, especially if a competing airline acts faster.{source: Ahmed Abdalghany}

- ### Identifying the demand

The second step is pertinent to identifying the demand generation for the new proposed routes. In other words, it identifies sources or markets from which demand could be generated.

For routes serving as point-to-point, the demand is only generated between the city-pair of the route. For hub -and-spoke airlines, the demand on the route includes the demand to/from the hub (local demand) and the demand to/from the different destinations that the airline is serving beyond the hub (connecting demand).

Connecting travellers will be using the proposed route as part of their connecting itineraries. Attention should be given to demand that the new proposed route could attract from adjacent destinations. In addition, demand that could be generated from possible interline agreements (for example, code-sharing) should also be taken into consideration. All characteristics of demand such as purpose of travel (leisure, business, religious, visiting family and friends), income, and age should be identified.

The demand of the route in a point-to-point airline network is estimated simply by multiplying the size of the total demand in the local city-pair by the market share of the itinerary representing the route. For a route in hub-and-spoke airline, demand is calculated in a similar way for the local demand. In addition, the connecting demand from each city-pair is estimated by multiplying the itinerary's market share in the city-pair by the size of demand in this city-pair. Then, total demand of the route is calculated by adding the estimated local and connecting demand. An approximated revenue is estimated by aggregating the revenue from the local and connecting traffic. {source: Ahmed Abdalghany}

- **Identifying the volume**

The next related task is predicting the size of each source of demand generation. This task is about predicting how many travellers (or how much cargo) could be travelling in each city-pair that could be generating demand to use the proposed route. In other words, this prediction is for the city-pair that generates the local demand and city-pairs that generate the connecting demand (if any).

This demand is estimated regardless of the mode of transport. It includes knowing the historical demand travelling in the city-pair with its growth, seasonally. It also includes estimating the additional demand that could be stimulated or attracted from nearby destinations, when the new route is served.

This step is tricky because it is well known that demand is supply-dependent. In other words, the amount of demand that could be stimulated or attracted will depend on the new service (i.e. its price and quality). It is obvious that the ability to accurately determine the demand-generating markets together with their size is crucial for the process' accuracy. One major drawback is when planners rely on a single source for data and a single methodology for predictions. Data sources and prediction methodology could vary significantly, especially in less-developed markets. Thus, it is highly recommended that planners rely on several resources for data collection and demand prediction to minimise any potential bias. {source: Ahmed Abdalghany}

- **Identifying the competition**

The next step in the process is to know the competition. In each city-pair that generates demand (either local or connecting), all competing itineraries are identified. These itineraries could be non-stop or connecting itineraries.

Each itinerary is identified by its measurable characteristics including price, number of stops, departure/arrival time, travel time, travel distance, connection duration and location (if any). Other competing modes of transport such as trains and buses are also identified with their characteristics.

When the set of competing itineraries in each city-pair is identified, a methodology is used to estimate the market share of each itinerary. Relying on large sets of historical data, there have been several models developed to estimate the market share of each competing itinerary in a city-pair. These models, which are known as the Quality Share Index (QSI) models, estimate the market share of the itinerary as a function of its measurable characteristics. These models typically vary in the comprehensiveness of their methodology and the accuracy of their results. Again, where possible, planners should adopt more than one model to estimate market shares to minimise any bias. {source: Ahmed Abdalghan}

ROUTE DEVELOPMENT IN INDIA

Route development in India is at its fast pace. With the development of new airports, it has opened up new routes all over India. India's civil aviation minister Suresh Prabhu has vowed that 100 new airports will be built in the country over the next ten to 15 years at a cost of $60bn.

"The aviation sector has the potential to contribute significantly to the contribution of not just India's economic growth, but also the world at large," said Prabhu.

"One hundred new airports are being planned to be built in India over the next ten-15 years with an investment of $60bn. We are also working on the cargo policy which will provide a boost to the nation's logistics capacity." {source: David Casey}

The Ministry of Civil Aviation on Monday said 78 new routes have been identified and approved under Phase 1 of UDAN 4.0 and that 100 airports/heliports/water aerodromes will Be developed by 2024 under RCS UDAN. Airports Authority of India, the Implementing Agency is in the process of awarding these routes to the Selected Airline Operators (SAOs), government said. 4th round of bidding has commenced on 3 December, 2019.

After three rounds of bidding under Regional Connectivity Scheme (RCS)- Ude Deshka Aam Nagrik (UDAN), pre-COVID, 688 valid routes were awarded, out of which 281 routes were operationalized. After suspension of domestic flight operations from 25 March-24 May, domestic air services including RCS operations have recommenced with effect from 25.05.2020.{source: J. Jaganath}

AIRLINES ROUTE PLANNING

Airlines around the world are constantly looking to add new destinations to their route network. They perform multiple route evaluations in order to know if a route will be profitable in the long term or not. Air carriers use many programs and tools to perform their route studies. They look at passenger demand forecasts, hub connectivity, aircraft availability, and other competitors. Here are the four key considerations that an airline must make while both tweaking existing routes and planning new ones. {SOURCE: Nicolas Bernier}

- **Demand forecasting** {SOURCE: Nicolas Bernier}

Before starting a new route, airlines want to know how many passengers will travel on their flight. Most airlines use aviation market intelligence tools to parse and analyse all available data.

This data comes from within the airline itself, as well as industry-wide passenger data that identifies trends in traffic. Essential data points to consider are fares, routes, airlines, and connections. Airlines deploy this data to determine how many passengers are traveling each day (including connections) between airport pairs.

- **Connectivity at the Hub** {source: Nicolas Bernier}

Most airlines have one or more hubs where they operate most of their flights. The job of the Network Planning team at an airline is to ensure that most passenger will be able to go to the destination of their choice in the airline's route network.

For example, if you are flying out of Daytona Beach International Airport, the only nonstop flights are to Atlanta, Charlotte, and New York-JFK. At these airports, the flights are timed to allow passengers to connect to another flight which will eventually bring them to their final destination. Local traffic between point A and point B is important, but airlines can also get more traffic flow by getting passengers from connecting flights at the hub.

Airlines can predict revenue and profitability on a route depending on different times of the day. If the flight is scheduled at a time of the day where there are no possibility of connections to other cities, then the airline might not do as good as a flight that is timed for inbound and outbound connections. Some flights have an optimal time for local traffic while other flights are timed for passenger connectivity.

When an airline fly multiple times a day between two cities, the flights are usually evenly spread out during the day. Business travellers usually enjoy taking a flight early in the morning and return home at the end of the day after their meetings.

- **Aircraft availability** {source: Nicola Bernier}

An airline will have to source an aircraft when deciding to fly to a new destination. A major airline with a large fleet of aircraft might be able to find a spare aircraft and assign it to the new route.

It will be easier for an airline to pull an aircraft from its fleet for a 1-hour domestic flight than a 15-hour international flight. A regional aircraft might fly four to five flights a day to different cities while a wide-body airplane might only fly once a day on an 8-hour oversea flight.

Not all aircraft can fly on a particular route. Aircraft limitations are taken into account when aircraft are assigned to a route. For example, a 70-seater regional jet cannot fly from North America to Europe because it simply does not have the range to do such missions. Some aircraft perform better than others at airports with high temperatures and higher elevation.

- **Matching the competition** {source: Nicola Bernier}

Opening a new route that is already flown by another air carrier is not unusual since there are thousands of airlines operating in the world. The route between New York (JFK) to London (LHR) is flown by many different airlines flying multiple times a day. Starting this new route will be a challenge for an airline. However, flying to a smaller city with no airline competition might be a better option. Few airlines might have an advantage over smaller ones. Large airlines, as mentioned earlier, can feed there flights at their hubs with connecting passenger traffic. On the other hand, smaller airlines who do not operate many flights at their home airport might mostly rely on local traffic to fill their flights.

RESEARCH METHODOLOGY

The research methodology in this report is both qualitative and quantitative. And, also all the data is being collected is from the secondary sources.

QUALITATIVE

As mentioned above, the government of India has promoted regional connectivity under UDAN scheme. As a result, more than 100 new airports are constructed and also reconstruction of non- operational airports in India is under process. This has led to rise of more than thousands of new routes to be open for the airlines in India.

FACTORS CONSIDERED FOR DEVELOPMENT OF NEW AIRPORTS

POPULATION OF THE CITIES/TOWNS {source: Deloitte Touche Tohmatsu India Pvt. Ltd}

These towns are further classified as:

- towns having population greater than 10 Lakhs (53 in number),
- towns having population between 5 and 10 lakhs (46 in number)
- , • towns having population between 2 and 5 lakhs (129 in number) and
- towns having population more than 2 Lakhs (230 in number).

It was observed that towns with population of more than 1,000,000 already possess high connectivity and have witnessed high economic growth rates. Further, the towns in the lower population bands are being considered as the new growth centres in the country. As per one estimate, towns with population of 0.5 million and above would be the ones which would be able to absorb large population growth rates in the future. 8 From a policy perspective, towns / cities with population in the band of 2 lakhs and above (top 50 percentile) would be ideal candidates for promoting air connectivity so that such connectivity could contribute to the economic growth of such towns / cities.

ECONOMIC POTENTIAL {source: Deloitte Touche Tohmatsu India Pvt. Ltd}

As per Boeing's long-term assessment of aviation market, as illustrated in Current Market Outlook 2021-2031, economic growth rate is the best explanatory variable for air transport demand and around 60-80% of air transport demand is attributed to economic growth. Further, the report also states that air travel revenues consistently average about 1% of GDP in countries around the world, regardless of the size of the national economy.

TOURISM POTENTIAL {source: Deloitte Touche Tohmatsu India Pvt. Ltd}

Tourism is a key demand-driver for air transport services to a town / city with the demand in this case focusing on incoming tourists to the identified towns / cities and not the native population or their income levels. While, rail and road networks extend across the country, some tourist sites such as national wildlife parks and sanctuaries are still beyond the reach of surface connectivity and are time-taking and inconvenient for tourists to reach.

Some of the tourist destinations could witness more tourist numbers if properly connected by air. While there would be different segments of tourists (international, premium domestic, budget, etc.), in general they would be contributing to the local economy through use of services – a multiplier effect of providing air connectivity to a tourist destination. Also, in view of their propensity to spend on leisure, tourists are more likely to have specific choices on more convenient and time-effective modes of travel.

QUANTITATIVE METHODLOGY

As mentioned above, in airline route planning various factors are to be considered while selecting a particular route. Also, the airports based on the various factor then plan to develop the required infrastructure. These are**:**

Aircraft types: In India there are four types of aircraft that be used by the airlines for carrying out it's operation;

- More than 100-seater aircrafts,
- 70-seater aircrafts,
- 40-seater aircrafts and
- Less than 20-seater aircrafts.

Based on the aircraft type and other mentioned factor, the airports then accordingly plan it's infrastructure. For example: Based on data obtained from AAI, it is observed that most of the locations having an airstrip have a runway length (minimum ~1400 mt.) sufficient to handle up to a 40 seats plane. About fifteen of them have runway length (~1700 mt.) with a capacity to handle up to 70 seat aircraft and only about eight of these have a minimum runway length of 2300 mt. to handle

narrow body aircrafts of the likes of Airbus 320 which have a seating capacity greater than 100 seats. About 10 of these locations have Night Landing facility. {source: Deloitte Touche Tohmatsu India Pvt. Ltd}

And, also the airport then has to provide other facility as well like:

- Salary to the employees
- Depreciation
- Maintenance cost
- Security etc.

ANALYSIS

Earlier, India was incurring second highest airport charges in terms of landing, parking, and housing charges. If, we look at the 2011 statistics for the airport cost of the major hub airports of India, we will find a huge increase. Below is required data:

- At Delhi airport, there was 346% increase in aeronautical charges approved by the AERA(Airport Economic Regulatory Authority) effective 15 may 2012. Reason: Demand
- At Mumbai airport, a 164% increase can be seen in terms of revenue of the airport because of increase in aeronautical charges.
- At Kolkata airport, a 219% increase in the airport charges was approved by AERA.
- At Chennai airport, 141% increase in revenue because of increase of revenue charges.
- At Bangalore and Hyderabad airports, soon increase of airport charges could be seen after consultation with AERA.

This was the situation before, but after the approval of regional connectivity scheme by the government a significant relief could be seen. They are:

Relaxation in Airport and Navigation Charges by AAI and certain private airport operators A. Relaxation in Route Navigation Facility Charges at AAI Airports:

• Airports Authority of India has provided relaxation to small aircrafts registered in India in payment of the Route Navigation Facility Charges (RNFC). The relaxation is as follows:

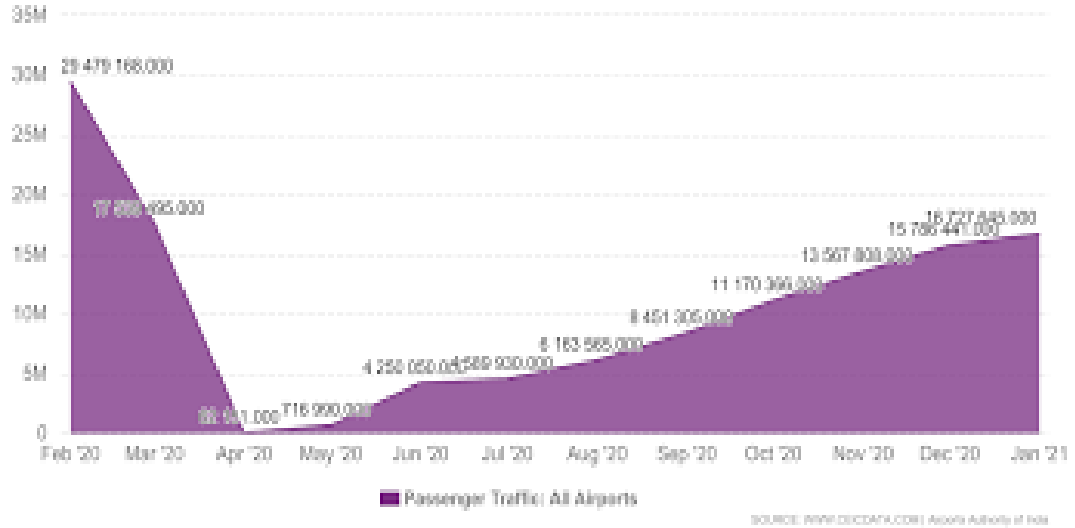
• In respect of aircrafts with maximum All-Up-Weight: (i)Upto 10,000 Kgs Shall be levied @ 20% of the applicable rates f weight –cum – distance formula; (ii) More than 10,000 Kgs to 20,000 kgs shall be levied @ 40% of the applicable rates of weight-cum- distance formula. B. Relaxation in Landing Charges at AAI Airports:

• Landing Charges for Small Domestic Aircrafts up to maximum All Up Weight of 21000 Kgs shall be levied @ Rs.113.30/- per thousand Kgs. There is no minimum charge for this category.

• No landing charges shall be payable in respect of:- (a) aircraft with a maximum certified capacity of less than 80 seats, being operated by Domestic Scheduled Operators ; and (b) Helicopters of all types.

• Landing & Parking charges at all airports in the North Eastern Region, Jammu & Kashmir, A&N Island and Lakshadweep (other than Defence Airports) to be reduced by 25% of the current rates {source: **Deloitte Touche Tohmatsu India Pvt. Ltd}**

GROWTH OF PASSENGER TRAFFIC IN INDIA {source: ceicdata.com}



we can see in the above statistics that the growth of passenger in India for air travel is increasing significantly. And to manage the air travel is very much required, since, the burden is on the few selected airports. The data is provided below: {source: The Hindu} for the financial year 2019.

Losing speed

Among major airports, Mumbai's terminal saw contraction in passenger traffic

Table	Total passengers	% growth in Intl	% growth in domestic
Delhi	6.9 crore	7.6	4.6
Mumbai	4.8 crore	5.7	-1.3
Bengaluru	3.3 crore	17.5	24.8
Hyderabad	2.1 crore	8.1	20.4
Chennai	2.2 crore	7.6	11.9
Kolkata	2.18 crore	7.7	10.3
Ahmedabad	1.1 crore	15.9	23.3
Cochin	1.01 crore	-8.6	8.5
Pune	90 lakh	-7.7	11.7
Goa	84 lakh	-6.4	23.3

SOURCE: AAI

With the above data it is clear that these airports are controlling huge passenger traffic in India, but with more airports burden on these airports would be less and also demand would be divided which would benefit the airlines but not the airports because revenue would be divided.

DOMESTIC PROJECTS OF THE GOVERNMENT {SOURCE: AAI}

Chaudhary Charan Singh International Airport, Lucknow

i) C/o New Integrated Terminal Building

Area	1,11,367 square meter (including Basement of 20461 sqm. and 6646 sqm. area)
Annual Capacity	13.6 MPPA (Million passengers per annum)
Peak Hour Handling (PHP) Capacity	4000 pax (3200 Domestic & 800 International)
Project Cost	Rs. 1383 crore
Project Commencement	Sept 2018
Probable Date of Completion	Sept 2021

The ongoing development of the city of Lucknow will lead to increase in both Domestic and International passengers passing through the Airport. The Airport is forecast to develop beyond 10 million passengers per annum over the next decade.

The terminal Architecture will endeavour to express the position of Lucknow as a key central city of the province of Uttar Pradesh. Strong references to the Culture and Traditional Architecture

will be expressed by the building's Architecture. Arriving and departing passengers will sense this identity and reference to place. The building will be provided with aesthetically appealing and soothing interior decoration matching the modern structure. The new terminal will be designed to process both International and Domestic flights within one building and the capacity to process up to 4000 passengers/hour.

Below is about Chennai airport and similarly there are more than 100 airports that has been constructed all over India, with more than 1000 new routes. The reason providing it with the detail is that it provides the information on how the government is controlling the airport cost so as to attract the airlines to these routes.

Chennai International Airport, Chennai

i) C/o New Integrated Terminal Building & Allied Works

Area	236044 square meter
Annual Capacity	22.54 MPPA (Million passengers pe
Peak Hour Handling (PHP) Capacity	5000 pax (4100 Domestic + 400 Inte
Project Cost	Rs.1342 crore
Project Commencement	04.07.2018
Probable Date of Completion	August 2022

The rapid growth, constraints to expand the existing terminal buildings and the need to upgrade facilities to international standards, prompted AAI to take up the second phase of modernization. It includes demolition of the existing domestic terminal T2 and international terminal T3 and rebuilding them with 2 levels. The design of the terminal is derived from the traditional form of local art and culture; especially the traditional costume of Bharatanatyam dance form. It can be felt in the dynamic roof form which reflects the movement and lightness of ripples in a fabric. This gently curved structure unifies all the terminals of the airport and gives it an integrated look. The round roof lights at the peak of the pleat provide the space below with natural light as well as the mean to extract smoke. The roof will then cantilever over the forecourt road to create a welcoming space and weather protection for the passenger and visitors alike.

Inspiration was taken from Kolam for the interiors. Kolams are thought to bring prosperity and positivity to a space. Display of local art forms, sculptures, abstract patterns derived from Kolam and local crafts will give a local yet modern touch to the airport.

Locally available materials like granite, and eco-friendly materials would be largely used. The overall setting would help in achieving the airport a 4star GRIHA rating. An eco-friendly airport indeed!

ii) Upgradation of Airside Infrastructure

To meet the demands of Modernisation and Up gradation, Augmentation of airside is also under progress.

Up gradations like Construction of 3 Nos of RET's for the main Runway 07/25 and 2 Nos for Secondary Runway 12/30, Straightening of parallel Taxi-Track, Strengthening of Existing Apron and Taxiway to cater Code 'E' Aircrafts were under construction for reducing the runway occupancy time. Also, Reconfiguration of Apron in to MARS stands is taken up to increase Apron capacity.

SUMMARY

Airline route development has a significant effect on the airport cost. With, the aircraft opted for the operation, its demand, economic growth, passenger growth defined will ultimately has an impact on the use of airport area. The airport then, accordingly have to plan its area of operation which is require to handle the number of flights. Allotting of parking bay, runway strength, hiring personnel and staff, MROs, etc. and if it is required then accordingly expansion of the airport area of operation. We can clearly understand in the data provided above that, with the increase in the demand the airport cost has gone up to manage the revenue of the airport. The ATF (Air Turbine Fuel) prices are never fixed and covers above 50% of the total cost of operation and managing availability and storing is a huge task and require huge revenue.

In the above, mentioned information, it can be very well understood that the there was a high dependency on few major hub airports to control the flow of passenger traffic, but, with the Regional Connectivity Scheme the diversion of the passenger traffic could be seen. And airlines can now opt for the better routes and the airports have to attract these airlines to there airport by reducing the airport cost as mentioned above.

Since, there is a lot of changes that the government have taken to make the flights rate cheaper and affordable, one of the steps is UDAN Scheme under which more than 100 operational airports are be constructed and opening of 1000 new cost-effective routes as well by expanding the area of operation and also expansion of airspace for the commercial flights as well. Attracting the airlines to these routes would be much easier, since it would be cost effective.

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CERTIFICATE FROM THE FACUTY GUIDE

This is to certify that the project report “A Study to Investigate the Impact of Airline Route Development on Airport Cost” has been prepared by Ms Jaya Singh under my supervision and guidance. The project report is submitted towards the partial fulfilment of 3 years, full time Bachelor of Busines Administration.

Name and Signature of Faculty

Date:

Declaration

I, Jaya Singh, Roll No. 18Slam1020127, student of BBA in Aviation Management of School of Business, Galgotias University, Greater Noida, hereby declare that the project report on "A Study to Investigate the Impact of Airline Route Development on Airline Cost" is an original and authenticated work done by me.

I further declare that it has not been submitted elsewhere by any other person in any of the institutes for the award of any degree or diploma.

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ROUTE DEVELOPMENT

Route development is an essential function for airports planning to attract new services. It is also a core function of airline planning that aims to expand airspace networks and/or shift resources to better opportunities. {SOURCE: Ahmed Abdelghany}

RULES OF ROUTE DEVELOPMENT
* UNDERSTANDING YOUR MARKET: It is important to understand YOUR market – you cannot target everyone, which is why you need to focus. Understanding the market starts with trying to quantify it. The number of passengers between any two points will be a fraction of passengers either travelling indirect via another airport or potentially through surface leakage. Make sure you understand the direct/indirect split and surface leakage. {source: ASM network} Quantifying the market could involve aspects other than hard and fast passenger traffic volumes. This will help segment the market and understand where the passengers will come from.
The following indicators are all valuable sources of data to help describe your market:
Economic and social indicators: - Corporate travel potential: how many people, how often and currently who with? - Employment sectors: e.g IT, pharmaceuticals, finance - Forecast economic growth rates - Commercial/economic ties: with target route destination - Main exports/imports: trading partners - Population trends Tourism indicators - Origin/nationality of visitors - Number of bed nights - Understanding source markets - Unique leave patterns - Events, festivals, places of interest - Demographics: ethnic ties generate visiting friends and family (VFR) traffic. {sources:PATA,} WTO, your local tourism board As well as this, be sure to include projections on yield, seasonality, directionality and leakage – surface or carrier. A traffic forecast is essential. A forecast will help you access the market and give your pitch credibility as well as demonstrating that a scientific approach has been taken to show that the opportunity is viable. For network carriers in addition to beyond/behind passenger forecast detail is relevant.

* UDERSTANDING YOUR CUSTOMER: Understanding your competition is essential. Which airports are in your catchment area and which airports / destinations are your competitors in different market segments: FSC, LCC, Charter, Cargo and regional scheduled carrier. It is important to monitor your performance against your competitors and to understand your competitor's route development activities, pricing and product. Who are airport's competitors? • First and foremost, other airports - whether they are local, national or international, these are an airport's most direct competition as they may be able to offer your customers a better location or a better cost. Their offering, location or amenities could be superior to yours, and the strength of their based carriers must be considered. • Other transport options – such as rail, road, ferry or coach. Your airport is in direct competition with these modes of transport because they might be more convenient for your potential customer, or they could be more cost effective. The speed in which the customer can reach their destination will also be considered. • Competing stakeholders – like tourist authorities or regional government. These competitors are in a position to offer a better market, they have ASD resource strength, and they have access to funding. • Communications technology – be it conference calls, Skype, FaceTime and other communications platforms. Advances in technology have the potential to reduce the requirements for travel. Compare your market size by addressing what your largest unserved

markets are, as well as the largest unserved markets of the competition choices for the airlines. The average fares of your carrier should also come into account: look at how the average fares in your market compare to others in the region and the others in the airline's network. In understanding its competition an airport and destination should have insight into its market position and where it ranks. It is important to develop a clear, credible position and brand to deliver success in an increasingly competitive industry. {source: ASM NETWORK}

* UNDERSTANDING YOUR CUSTOMER: As an airport or destination your most important customers are the airlines and tour operators that serve your market, bringing in passengers and visitors to your market. There are a number of different airline business models that have varying needs, from full-service carriers, charter airlines, low-cost carrier airlines and ultra-low cost operators. As the aviation market has developed so airlines have developed hybrid business models to segment the market. Each airline or tour operator will have different needs in terms of market, financial and operational requirements. Understanding the airline involves understanding; fleet / network / scheduling priorities / operational requirements / financial support / market fit / geographical fit / brand strength in the market place. Decision making processes differ from airline to airline. Some decisions always go to the Board, for other carriers the network development team will make the decision. Understanding the perception of the carriers have of your market can be tested through a simple questionnaire. {source: ASM NETWORK}

ROUTE PLANNING

Route planning is the process of identifying and evaluating the feasibility of new routes for an airport by a given airline. Recently, some numbers have been shared on the success rates of new routes. This rate is defined as the percentage of newly developed routes that remain in service one or two years after inauguration. As this rate increases, it indicates that the airline has the capability to properly anticipate new route performance in the short term. One would expect that this rate is on the high side, given that most airlines deploy internal and external consulting resources to study route feasibility before their deployment. Unfortunately, this has not been the case.

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· It is also a core function of airline planning that aims to expand airspace networks and/or shift resources to better opportunities. Planning new routes between airports Route planning is the process of identifying and evaluating the feasibility of new routes for an airport by a given airline.

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Make sure you understand the direct/indirect split and surface leakage." When it comes to understanding the competition, Mayes says one of the boards' key rivals is other tourist boards. They can offer better marketing or funding deals, so a tourist board needs to know this information in order to ...

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