

AIRPORT INFRASTRUCTURE CHALLENGES FOR REGIONAL CONNECTIVITY IN INDIA

Abstract

In last two decades, Indian aviation has witnessed unprecedented growth in traffic. Since 1953, only two National air carriers were allowed to operate. The monopoly of Government Airlines, Indian Airlines (Domestic carrier) and Air India (International flag carrier), ended when in 1994, the Government of India repealed the Air Corporation Act and allowed Private Operators to provide air transport services. Introduction of Low Cost Carriers (LCCs) in 2003-04, led by Air Deccan and strong economic growth during this period, further fuelled air traffic growth in India. However, the growth triggered demand for increase in capacity of airport infrastructure due to congestion resulting into low level of service at airports.

This paper examines the gap between demand and supply in airport infrastructure in the last two decades in India, the challenges faced in creating capacity to handle the growing air traffic and lesson learnt in first phase of rapid growth to augment the capacity in second phase of emerging traffic demand due recent policy initiatives in terms of New Civil Aviation policy-2016 and subsequent launch of Regional Connectivity Scheme, by government of India, which is resulting into additional airport infrastructure requirements and ordering of aircrafts by almost all major airlines and new entrants.

While the first phase of traffic growth in early 2003-04 was mostly triggered by introduction of low cost carriers and growing economy of the country, the second phase of growth was triggered by lower oil prices, aircrafts ordered by the airlines and further liberalized approach introduced through new civil aviation Policy.

However, there is a need to learn lessons from the time and cost overruns in implementation of airport infrastructure projects experienced in first phase for efficient project management in the second phase of traffic growth being observed in the sector.

Key Words: Low cost carriers (LCCs), Capacity deficit, Mega projects, Public Private Partnership, Cost and time overrun, Regional Connectivity Scheme, Commercial Outsourcing model, Viability Gap Funding (VGF).

1. Introduction

A major Policy initiative towards development of airports was launched in India in 2003-04 to cope with sudden capacity deficit at airports that arose due to unprecedented traffic growth, especially in the top 15 airports, largely due to emergence of low-cost carriers and growing economic strength. The challenge was met through a two-pronged strategy of developing 35 non-metro airports and going for mega projects at metro airports. The two existing metro airports at Delhi and Mumbai were upgraded through Public-Private Partnership (PPP) and two new greenfield airports at Bengaluru and Hyderabad were developed in private sector with limited equity participation of state governments and Airports Authority of India (AAI).

The capacity added during this period and up to 2007-08 started getting saturated due to further phase of high traffic growth witnessed 2014-15 onwards, mainly due to low oil prices. This growth necessitated second phase of airport capacity addition. The total terminal capacity available at Indian airports is around 271 million passengers per annum against the requirement of around 450 million passengers per annum in next 5 years. Total 309 million passengers were handled during 2017-2018 at Indian airports (AAI website).

Though there was overall excellent traffic growth in India and it is now the fourth largest domestic civil aviation market in terms of traffic and is expected to become third largest domestic market (behind the US and China in next 5 years (*Potential and challenges of Indian Aviation*” IATA Report, 4th September 2018)), the growth is limited to the top 15 major airports while the remaining 80% of airports get only 20% share of traffic; this is not desirable for a growing economy, as air transport is now considered essential for economic and industrial growth of any nation.

2. The Need for Intervention

2.1. Policy Initiatives by Government of India- National Civil Aviation Policy-2016

To trigger air transport growth in regional and remote sectors, the Government of India launched the National Civil Aviation policy in June 2016. The main focus of the new policy was on regional connectivity as, due to various reasons, the air traffic growth in India in last two decades was mainly limited to top 15 cities, where around 80% of air traffic was concentrated. Studies carried out by International Civil Aviation Organization (ICAO) in past has proved that air transport is no more a transport for elites of the society, and it contributes greatly towards triggering economic activities and employment generation around the areas where airports are located. Aviation's global economic impact is estimated at \$2.7 trillion, equivalent to 3.6% of world GDP [“Aviation Benefits Beyond Borders”, Air Transport Action Group(ATAG), October 2018] With the continued demand of regional air connectivity at affordable prices in the Indian aviation industry, Ministry of Civil Aviation (MOCA) announced their Regional Connectivity Scheme in October 2016 which is also popularly known as UDAN (Ude Desh ka Aam Naagrik) scheme. As more citizens join the aviation network, the national aviation market, already one of the fastest growing markets in the world, is expected to welcome many first-to-fly customers. To make air travel accessible to citizens in the regionally important cities is the main mission of UDAN.

Airports Authority of India (AAI), a state owned enterprise, has been assigned the responsibility of implementing the scheme. The scheme basically is demand driven where various concessions and supports are extended to bidder airlines, to attract them to remote and regional airports by reducing their operational costs. Apart from concessions by Central Government, State Governments, airport operators and Airports Authority of India as Air Navigation Service provider, a Viability Gap Funding is also provided by union Government (80% share) and State Governments (20% except North Eastern States where it is 10%). This VGF is funded through application of a levy of Rs. 5,000 per departure on profitable trunk routes identified through Route Dispersal Guidelines (RDG dated 16th August Government of India).

To reduce the cost of operations of airlines on flying such routes, the central government will provide concessions in the form of reduced excise on Aviation Turbine Fuel (ATF), Service Tax, flexibility of code sharing, etc. State governments will also lend their hand and lower the Value Added Tax (VAT) on ATF to 1% or less. Security and fire services will be provided free of cost, while electricity, water and other utilities will be given at substantially concessional rates. Additionally, landing and parking charge and Terminal Navigation Landing charges will not be imposed by the airport operator on UDAN routes and discounts will be given on Route Navigation Facility Charges by AAI.

[1] The airfare for a one-hour journey of approximately 500km on a fixed-wing aircraft or for a 30-minute journey on a helicopter would be capped at Rs 2,500, with proportionate pricing for routes of different stage lengths or flight duration (Regional Connectivity Scheme, Ministry of Civil Aviation, Government of India, December 2016).

The selected airline operator would have to provide 50% of the flight capacity (subject to a minimum of nine and a maximum of 40) as Regional Connectivity Scheme (RCS) Seats for operations through fixed wing aircraft and a minimum of five and a maximum of 13 RCS Seats on the RCS Flights for operations through helicopters and would be given three years' exclusivity of operations. On RCS route, the minimum frequency would be three and maximum of seven departures per week

2.2. Identification of Airports for infrastructure upgradation through UDAN bidding:

The first round of RCS bidding process, basically a “Swiss Challenge method of Bidding” was launched by AAI, in October 2016. After 3-4 rounds of stakeholder's consultation meetings and pre bid conferences, 27 route/networks were awarded to 5 successful bidders. As per policy, they are required to obtain Scheduled Commuter Airline Operator Certificate from DGCA (Director General of Civil Aviation) before starting flight operations at awarded routes. The airports to be connected by these airlines are also required to be developed to required standards to obtain Airport License from DGCA.

The diversity of these proposals indicates that a variety of business models may thrive in India's aviation sector. The interest shown by bidders to participate in the first phase of RCS-UDAN establishes the fact clearly that growth is sustainable. The proposed connectivity between currently underserved and un-served airports with the country's fast-growing aviation network will enable people to move from one place to another in shorter time and will spur further economic development.

Looking at the benefits that can be fetched, most of the states have already signed the Memorandum of Understanding with MOCA/AAI for various supports and concessions as per scheme. AAI also invited bidders to submit counter proposals against the initial proposals on Swiss challenge model of bidding. This step is followed by the opening and scrutiny of technical bids, and subsequently financial bids, for initial proposals as well as counter proposals.

The routes or networks were awarded to bidders who submitted valid proposals and quoted the lowest Viability Gap Funding (VGF) from the government for such routes/networks.

2.3. Airport Infrastructure Development: Revival of existing airports with Government funding

AAI, as Implementing Agency for RCS, is working on revival of unserved and underserved airports to facilitate the Regional connectivity scheme. Government of India has decided to fund revival of 50 airports owned by Central/State Governments and public sector enterprises, including capital cost of security and fire equipment at private airports and also where these services are the responsibility of respective states. However, unserved airports owned by private entities are not entitled for government funding.

Revival of the air strips and airports is "demand driven" and linked to the awarded routes/networks under RCS bidding. Unserved Airports will be developed and operationalized as No-Frill Airports at an indicative cost of Rs. 500 million to Rs.1000 million (*National Civil Aviation Policy 2016, Government of India*). Around 100 awarded routes out of 300 have already have been operationalized after development and licensing of airports linked to these routes. Rest of the RCS flights are expected to commence within 5-6 months, depending on readiness of airlines and airports. 31 unserved airports under UDAN-1 and 25 unserved airports under UDAN-2, are to be developed/revived to start operations by carrying out short term interim works and long term up gradations works to ensure permanent availability of airport infrastructure for sustainable and safe airport operations.

Out of these 56 unserved airports, 27 airports to be upgraded belong to state governments, public sector under takings and private sector. However, the core issue projected by airport owners remains non-availability of expertise with state governments, PSUs and private sector airport owners to develop and operate these unserved and unlicensed airports for scheduled commercial operations under RCS.

Therefore, there is a need to create a Project delivery model to develop and operate these airports. There is the issue of commercial viability of airports as well, as it is observed that airports start making surpluses only when the traffic reaches around 20 flights per day. Therefore, there is reluctance on part of private airport operators to come forward and offer their airports for UDAN flights. The development works at private airports like Mithapur, Baldota and Raigarh are yet to start as private airport owners are reluctant to invest on development of their airports for public use and subsequently on operations and maintenance of the facility. Similar reaction was faced from state governments and SAIL (A Public Sector Undertaking under Ministry of Steel).

2.4. Options /project delivery models for development and operationalization of unserved RCS airports.

All unserved airports being revived under RCS scheme shall not be commercially viable with traffic revenue alone in the initial 5-6 years of operations, unless additional non-traffic revenue options are available to cover the deficit of traffic revenue and expenditure on maintenance and operations. At present, out of 129 airports of AAI, only 12 -13 are generating surplus. Basic reason for deficit is low traffic.

However, at RCS airports, the operational cost of airport operator gets reduced due to supports and concessions being extended by other stakeholders like State Government, central government and Air navigation service Providers i.e.

AAI, in case of Civil Airports and Defense ATC in case of Civil enclaves where operational area is with Defense authorities.

At RCS airports, as per RCS MOU with states, the fire and security services including equipment are to be provided by concerned state Governments. One-time fixed cost of up gradation and renovation of airport to make it suitable for operations is to be borne by Central government out of funds (Rs. 4,5000 million) approved for “Revival of 50 unserved airports”.

Thus the total cost of maintenance and operation of airport on part of Airport Operator will be limited to maintenance of airside infrastructure like runway, taxi track and apron and maintenance of Terminal building etc. Operations at RCS airport where generally one or two flights per day will be operating in the beginning, can be managed with a team of four executives and non-executives with annual maintenance and conservancy contracts, which may be already in place at a functional airport where occasional non-scheduled flights had been operating before operation of RCS flights and the airport had a Private license to operate. Based on the UDAN MOU with state governments, minimum operational expenditure and capital cost of airport upgradation is suggested at table 1 to 4:

TABLE 1. **INDICATIVE OPERATIONAL EXPENDITURE PER ANNUM AT MODEL RCS AIRPORT (MANPOWER EXPENDITURE (ASSUMING ONE SHIFT OPERATION))**

S.No.	Type of Manpower	No. of person required	Cost in Rs. per Month (Approx)	Cost in Rs per Annum (Approx)	Remarks
1.	Executive For Terminal and Air Side (Group A & B)	2 Nos. 1) Accountable Executive & 2) Safety Manager*)	1,50,000	18,00,000	May be arranged by respective State Govt/Airport Operator from their pool of officers & staff with required leave reserve.
2.#	Non-Executive (Group C&D)	2	75,000	9,00,000	
3.#	Cleaning staff (Group C & D) – Existing employee	3	45,000	5,40,000	

4.#	Electrician + Helper – Existing employee	1 + 1	35,000	4,20,000	May be arranged from State PWD / PSU Or Existing Annual Maintenance contract.
5.#	Plumber + Helper – Existing employee	1 + 1	35,000	4,20,000	May be arranged from State PWD / PSU Or Existing Annual Maintenance Contract.
6.#	Security staff – Existing Employee	51	-----	-----	As per RCS guidelines, Security Services and Fire Staff shall be provided by the respective State Govt. Deployment of Security manpower should be as per BCAS norms.
7.##	Fire Services – Existing employee	9	-----	-----	
(i)Sub-Total				40,80,000	Additional 2.4 million.(#) only .

Airport operators are already maintaining the existing airports. Therefore incremental cost for Scheduled operations may not be more than 25% of of S.No. 2,3,4 and 5 i.e. 0.6 million.(25% of 22.8 = 5.7 say 0.6 million/year). **Therefore, additional expenditure to be borne by Airport operator will be around Rs. 2.4 million/year (1.8 +0.6) only.**

Manpower cost of Fire and Security services to be borne by State Governments shall be around Rs 5 million and Rs 26 million, respectively.

* Safety Managers of respective airport operator/ PSU for air side requirement or retired officers of AAI/IAF.

TABLE 2 EQUIPMENT HIRING CHARGES – TO BE BORNE BY STATE GOVERNMENT

S.N o.	Type of Equipment	No. of Equipment	Hiring charges in Rs per annum each	Total Hiring Charges in Rs Per Annum	Remarks
1	Airport Crash Fire Tender	1	16,48,335	16,48,335	Used equipment on hire charges (Annual Maintenance Contract) by AAI
2.	Ambulance	1	Not available	NA	May be arranged by State Govt from local hospitals during operational hours.
3	X-Ray machine for Registered baggage	1	*	--	
4	X-Ray machine for Hand baggage	1	*	--	
5	ETD	1	*	--	
6	DFMD	4	*	--	
7	HHMD	5	*	--	
8	CCTV	16 to 24 camera	*	--	
9	Flight Info Display System	Up to 5 monitors	*	--	
10	PA system		*	--	
(ii)Sub-Total				16,48,335	To be borne by State Government.

* The capital expenditure can be reimbursed by GOI against Revival of 50 airports.

Table 3 Other Operational Expenditure

S.N	Head of Expenditure	Annual Expenditure in Rs	Remarks
1.	Repair & Maintenance	20,00,000	Reference taken from Statement of Expenditure of similar AAI operational airports.
2.	Consumption of Stores & Spares	20,00,000	
3.	Electricity, Telephone, Fuel & Water Charges	12,0000	
4.	Administrative & Other Expenses	8,00,000	
5.	Miscellaneous Expenditure	8,00,000	
	(iii) Sub-Total	68,00,000	Assuming 100% additional expenditure.
	Total Annual Operational Expenditure (i+ iii) For Airport Operator	9.2 million (approx.)	Incremental i+ iii= 24 + 68= 9.2 million

iv) Cost of Security and fire manpower (to be borne by State Government):- Rs.36 million /annum.(cost of 10 fire and 50 security manpower at Rs. 50,000/month)

v) Air Traffic Control Charges (AAI)- Cost of manpower (6 officers) and maintenance of equipment. - Rs. 15 million (at Rs. 1500000/month + Maintenance of equipment).

TABLE 4 ONE-TIME EXPENDITURE TO BE BORNE BY GOVERNMENT OF INDIA FOR UPGRADATION OF INFRASTRUCTURE

Upgradation of Infrastructure	Estimated Cost in Rs (million)

Engineering Works: ● Additional Porta-Cabins (as size of existing Terminal Building is only 1200 sqft.) i/c Partition, frisking booth, CCTV etc.● Barbed wire of 3' height to be fixed of on existing boundary wall● Crash Gates ● Watch Tower- 5 nos.● Fire pit and Cooling pit● Carpark- minor civil work. ● Wind direction indicator & Landing direction indicator.● Motorable perimeter road.● Grading & Drainage in basic strip.● Augmentation of Power & Water Supply.● Standby Power supply.● Other misc. / related works like runway repairing, marking, signage etc.	50
CNS Equipment: VHF TRANSCEIVER-10w DT1DVR/DIGITAL CLOCK	9
Airport System: X-Ray RB-1. X-Ray HB-1. ETD-1. DFMD-4. HHMD-5. Trolleys and Chairs	17.3
Fire Service equipment (ambulance , Tools etc)	10
Total	86.3

Thus a rough estimate for additional operational expenditure on part of AAI, State Government and airport operator will be approximately Rs.15 million, Rs. 36 million and 9.2 million per year.

The expenditure on part of airport operator on operations will be around Rs 10 million and traffic and non-traffic revenue will be limited to non-scheduled chartered flights and to some extent from car parking, F and B services etc.

However, airport operator can augment the revenues through city side development by leasing land for various revenue-generating activities like shopping areas, multiplexes etc. as per market survey.

There can be a situation where an airport operator owning more than one airport wishes to outsource the operations but all the airports may not be having sufficient land for city side development on commercial lines. This type of model where a owner can outsource a cluster of 3-4 airports in one go and make the deal attractive for lessors by offering city side land for commercial use at some of the airports where land is available and potential for commercial exploitation of land exists. The bidder can make profits at some of the airports and use the surplus for development and operations of other airports in cluster. State governments and PSU owners like SAIL etc. can use this model. Thus the project delivery models for revival of airports can be one of the following: -

a. **Commercial out sourcing model with city side development for non-traffic revenue-**

This commercial model will be based on cross subsidizing the deficit in airside operations by non-traffic revenue generated through exploitation of city side land including for non-aviation purposes. The airport can be leased to a suitable entity who will run the operations and will be able to generate adequate revenues to meet the expenditure and share surplus with the owner. This model of outsourcing the development and operations is most suited for the airports where adequate land is available on city side of the airport and there is no restriction on use of the land for commercial purposes. The capital of private airports cost can also be recovered through user development fee to some extent.

b. **Minimum subsidy based outsourcing model:**

This model of outsourcing can be adopted for the airports where the feasibility of generating adequate profits in immediate future may not be possible in spite of leasing the land on city side or where surplus land may not be available. Apart from charging user development fee to recover the capital cost, and generating revenues from non-aeronautical activities, a bidding process adopting minimum subsidy or Viability gap as bidding parameter can be adopted to outsource operations of the airport. The airport can be leased for 25 to 30 years to the selected airport operator who may

bid subsidy for first few years and then start sharing profits with the owner when adequate surpluses are expected to be generated by them.

c. **Outsourcing on cluster basis** –This will be a mixed model of “a” and “b” above. This model is suitable for owners like state governments, Public sector units like SAIL or private entities who has 23 airports at different locations with different degree of commercial potential. These airports can be outsourced together adopting any of the models mentioned above depending on the feasibility and commercial potential of the airports.

d. **Leasing of Private airport to concerned State Government** is also suggested. In this case the capital cost of upgradation can be claimed by state government from Central Government and operational cost shall be borne by state government as airport operator. State government can also opt for any of the outsourcing model for operations and maintenance.

e. **Development of Green field airport:**

Apart from revival of existing unserved airports identified through RCS bidding process, new airports are also being developed at the initiatives of state governments, Private entities or airports authority of India. These airports can be developed as no frill airports with minimum cost and can be opened to prospective airlines participating in RCS bidding cycles. Recent examples are Pakyong airport in Sikkim and Kishangarh in Rajasthan. which have been operationalized in second round of RCS bidding. However as per Green Field Airport Policy 2008 of Government of India, generally these airports will be developed under PPP mode by state governments. Some of the green field airports approved by government of India are listed below(Table-5):

TABLE 5 GREEN FIELD AIRPORTS APPROVED BY GOVERNMENT OF INDIA

1.	Mopa (Goa)	2.	Navi Mumbai
3.	Sindhudurg (Maharashtra)	4.	Shirdi (Maharashtra)
5.	Aranmula (Pathanamthitta, Kerala)	6.	Kannur (Kerala)
7.	Bijapur(Karnataka)	8.	Shimoga (Karnataka)
9.	Hassan (Karnataka)	10.	Gulbarga (Karnataka)
11.	Dabra (Gwalior, Madhya Pradesh)	12.	Pakyong (Sikkim)
13.	Andal-Faridpur (West Bengal)	14.	Karaikal (Puducherry)
15.	Kushinagar (Uttar Pradesh)	16	Bhogapuram(AP)

No Frills Airport model: -

For reviving and developing small airports for remote connectivity, low cost airport models are the only option to ensure short term and medium term viability of operations. A low cost airport terminal with modular design can be constructed along with small runway and other pavements within the cost of Rs. 1000 million where only small planes can land to start with. The terminal and pavements can be further expanded with traffic growth. The airports can be allowed to be run by local Municipal authorities with trained manpower certified by regulatory authorities.

Development of Defence Airfields for Civilian commercial operations:

There are around 28 defence airfields already being used for civilian commercial operations by constructing Civil enclaves at these airports. Some of these airports are also open for regional connectivity depending on the response from the airlines in RCS bidding process. Generally, around 90-100 acres of land is developed into a civil enclave by constructing Terminal and airside facilities for aircraft and passenger handling without compromising with the defence security requirements. Some of the civil enclaves like Goa, Pune etc. handle a sizeable traffic and are already saturated and need new airports. New green field airport is already planned at MOPA as second airport for Goa and site for greenfield airport at Pune is also under consideration.

3. Conclusion: -

Considering the past experience of developing airports to cope up with unprecedented traffic growth in aviation sector, this time also multipronged approach needs to be adopted with focus on participation of private sector. Various project delivery methods to attract private sector can be adopted, mainly giving option of city side land for development to generate adequate non-traffic revenue at low traffic airports.

The strategy can change on case to case basis, based on potential and market demand in the area. The cluster approach can also be adopted to allow cross subsidizations of the lossmaking airports with high revenue airports. Smaller RCS airports in Private sector where owners are reluctant to invest in development and operations, can be motivated by concerned state governments to lease the airport and outsource the operations and maintenance. Thus O&M of the airport can be outsourced to the original owner on commercial terms.

4. References

- [1] "Potential and challenges of Indian Aviation" IATA Report, 4th September 2018.
- [2] "Aviation Benefits Beyond Borders", Air Transport Action Group(ATAG), October 2018.
- [3] Regional Connectivity Scheme, Ministry of Civil Aviation, Government of India, December 2016.
- [4] Route Dispersal Guidelines, Ministry of Civil Aviation, Government of India, 8th August 2016.
- [6]. National Civil Aviation Policy 2016, Ministry of Civil Aviation, Government of India, June 2016.