# Strategic Flexible Planning and Real Options for Airport Development in India

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Abstract:

With market liberalization established airports regularly had to face greater uncertainties with regards to their planned investments. However, airport authorities as well as private stakeholders (through international consortia) continue to invest in ever larger and more capital intensive infrastructures. With traffic forecasts having a legacy of being grossly inaccurate, major uncertainties regarding these long-term investments arise. In contrast to such practice, both literature and empirical evidence suggest that airport development should be undertaken in incremental steps, avoiding over-commitment of funds and being able to adapt to a changed environment, including changed patterns of competition. This research will highlight exemplary scenarios that characterize paths of airport development in India. A decision tree analysis will provide a helpful tool to identify those paths for airport development that will minimize uncertainty and prove more effective in fostering robust and efficient growth for the Indian air traffic system as a whole.

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## Introduction

Forecasting traffic for given airports has notoriously been an inaccurate exercise (see de Neufville (2008) for inexactness of such forecasts). Intended to reduce the risk exposure for investors in airports, flexibility in strategic planning (FSP) as well as scenario forecasts have been important tools for planners of such projects. One type of uncertainty is commonly associated with unforeseen changes in the rate of traffic. Another kind of uncertainty can arise from the type of traffic. While forecasts usually distinguish between national and international routes, the distinction between full-service-carriers (FSCs) and low-cost (LCCs) often are made in a superficial or inadequate way. This problem is particularly relevant in emerging economies where LCC business models as such are often claimed by operators but little implemented in reality. Demand of such self-proclaimed LCCs can prove much less robust compared to real LCCs that operate in more developed countries. Also, the recent and very rapid growth in many emerging economies such as India provides for little reliability when extrapolating traffic figures into the future.

Thus, the author takes issue with the effectiveness of FSP and scenario-based forecasts, at least in the context of developing countries. Instead we suggest addressing the 'real options' that exist with regards to investing in specific infrastructure for different types of traffic. Rather than taking investment choices as given and finding financially-driven rationales for undertaking them, our approach to 'real options' would look at alternative investment paths in terms of cost, location and traffic that would also encourage competition from a structural perspective. Not only would such an approach result in globally lower cost and (spatially) more balanced growth for Indian air traffic, but also in a reduction of the systemic risk (see "uncertainty" above) within the air traffic system itself.

## The situation in India

A view at some exemplary cases among Indian airports (Annex 1 shows an overview of some pending projects) reveals some striking patterns of airport development as far as the country's biggest metro airports are concerned:

- Despite a huge demand for air traffic at affordable costs and a choking infrastructure, no investments are undertaken for low-cost airports. It is known that the costs for such airports would only be a fraction of those for terminals that cater to mixed operators (both FSCs and LCCs).
- New green-field investments that are located at the outskirts of cities are being undertaken through private concession models (PPPs). The exceptions to that rule are Mumbai and Delhi airports, which are centrally located and where PPPs are used to modernize both airports, but also to expand capacity through additional terminals, etc.
- The public airport operator AAI is modernizing metro airports that remain relatively centrally located in cities such as Chennai and Calcutta. In total, 35 such modernization projects across Indian metros are being planned for. They are operated as mixed terminals. In the cases of Hyderabad and Bangalore, AAI opted to terminate their operations after commencement of operations by the private operator at the new airports that are remote from the city center.
- An additional option is to modernize hundreds of former military air strips at the outskirts of many cities, either by the AAI or by private parties. This option has not been exercised so far.

## What is a “real option” in airport planning?

For most airport systems development plans, several “real options” may be found. The most obvious is the possibility for expansion. At a given point in time, decision makers may choose to increase capacity either through new construction or modernization of existing facilities. These alternatives may be understood as a real option. Another real option would be the type of airport to be built. We know that airlines have distinct needs depending on their targeted passenger types, i.e. low-cost carriers require faster turn-around times and are more receptive to lower airport user fees. When building or expanding any airport, the infrastructure requirement of such carriers would be different compared to full-service-carriers. A third level of “real option” would concern the location aspect of the airport. An airport may be centrally located or, for example, be situated at the outer periphery of a city, which would normally imply 1 hour or more of travel time before getting to the city center. The planner/ investor will have to choose a combination among all of these three dimensions of “real options”. Other options come to mind, for example the decision to operate multiple airports in a given city. For the sake of highlighting the current policy decisions made in India, we shall briefly discuss these options.

It becomes evident that some combinations among “real options” may seem less viable than others. For example, positioning a dedicated low-cost terminal more centrally to a city by modernizing existing or even setting up new infrastructure may seem sub-optimal, as it can not be found in India. However, this is what happened at Singapore’s Changi and at Kuala Lumpur airport: terminals that are dedicated to budget carriers have started operations there in 2006. Plans for further expanding their capacity are well in progress. Another unlikely option may be to modernize existing rather than construct new terminals that are remote from any city center. However, hundreds of former Air Force landing strips are waiting to be converted in India. By modernizing these air strips, low-cost carriers, regional aircraft as well as charter aircraft could benefit. Thus, many combinations are feasible and can open a much wider scope of “real options” compared to airport development as it is currently being planned and implemented in India.

“Flexible Strategic Planning” does not address this wide scope of options. For example, modernization of an existing airport could be considered, by analogy, as a form of flexible planning as it provides for effective gains in capacity through less investment costs as compared to new construction. The risk of today’s application of “FSP” is that it commonly focuses on options regarding mostly green-field investments, in particular those that do not offer dedicated terminals/ infrastructure for Low-Cost carriers.

## Analysis

A real options approach may help to reduce systemic risk, especially in a volatile environment. Taking into account all options for investment may influence on the nature of competition between airlines and improve demand in terms of its robustness: irreversible investment can be more vulnerable to volatility in demand (see Huber, 2006), while smaller and spatially more distributed investment may provide for more usage flexibility (see Ghemawat and de Sol, 1998) and adapt better to price-elastic demand in the end. In order to assess the potential of “real options” to yield robust growth in a competitive setting, both supply and demand side aspects must be considered.

<u>Irreversibility of investment</u>

One major issue that arises from the investment is due to its "irreversibility". As Dixit and Pindyk (1994) reflect: "…most major investment expenditures are at least partly irreversible: the firm cannot disinvest, so the expenditures are sunk costs. Irreversibility usually arises because the capital is industry or firm-specific, that is, it cannot be used in a different industry or by a different firm."

**Figure 1:**
**Irreversible investments represented through bold lines, reversible through dashed lines**

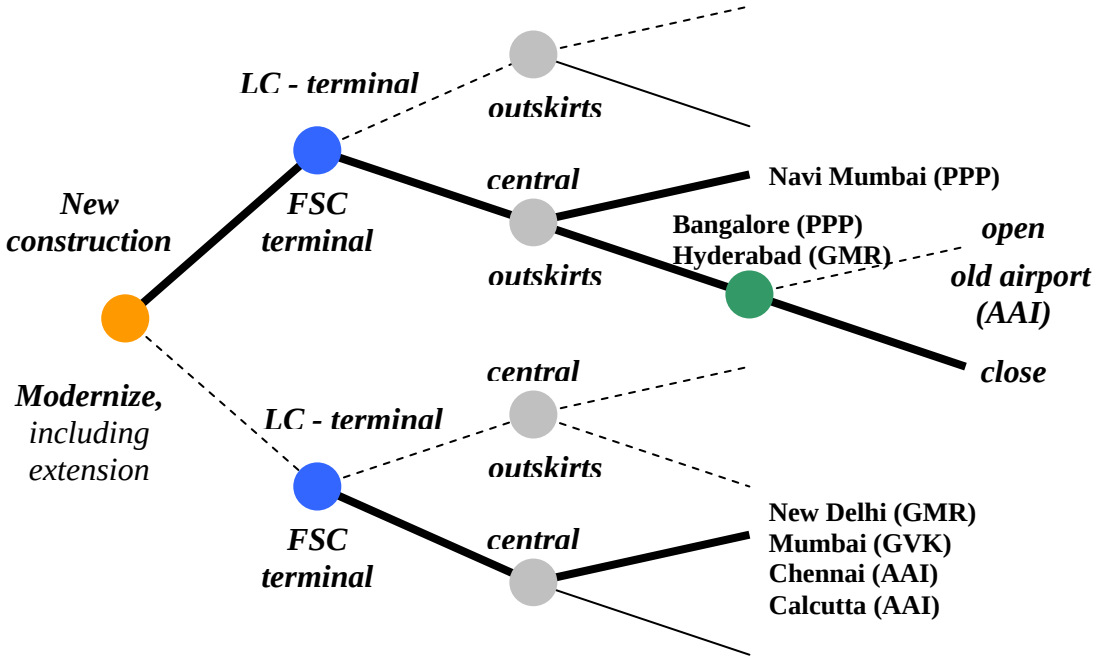


Figure 1 indicates different options with distinct degrees of flexibility or (ir)reversibility. These options are not to be confused with flexible strategic planning (FSP) that regularly accepts the paths of a decision tree as given and focuses on their modular (gradual) expansion afterwards, without leaving the decision path. From a conceptual point of view, the extent of irreversibility of a given path does not matter for FSP.

The different options of investment show some dominant paths that could have been taken: A highly reversible, i.e. usage flexible path could have been taken in the form of centrally located airports that dedicate their new terminals to budget airlines (as in Changi or Kuala Lumpur). Such new terminals in fact represent extensions of existing infrastructure. Their scale of investment cost is very low when compared to green-field projects that require new runways, control towers, gates, etc. In the case of an economic slump, the investment could be converted into even simpler operations (cargo), be upgraded (for FSCs) or easily be used for other commercial activities due to its central location. Such an option, however, is not being exercised by the actual modernization of centrally located Delhi and Mumbai airports: here expensive terminal extensions and modernization are being undertaken in a modular fashion without creating specific terminals for LCCs. It is noteworthy that both Indian airports follow FSP-principles by upgrading facilities in a modular fashion.

The least reversible option (highest degree of commitment) would have been new airport construction (green-field) at the outskirts of cities to serve both FSC and LC-carriers (through shared terminals, operations, etc.). This was actually the case in BLR, HYD and at a time was also planned for Chennai and Calcutta through PPPs. There are intrinsic risks to the investor and in the case of failure the investment may be lost due to its high asset specificity. Rather than a modular expansion after reaching a bottleneck threshold at 10-12m passengers, it is the continuation of existing operations at the city center and the creation of less expensive (and thus less-risky LC terminals at the outskirts) that could provide for a flexible alternative to this dominant model of costly green-field projects. The successful Airport Project of Cochin could also be considered part of the same category of options. However, much lower investment costs have been incurred there while addressing a specific international customer segment. This intelligent focus and a much lower initial capacity requirement set the case of Cochin apart from that of BLR and HYD.

At the other extreme, highly flexible and inexpensive investments could be undertaken at the outskirts of cities by converting already existing airstrips into basic, low to medium density airports. These airports could be upgraded to serve LCCs, similarly to the secondary airports that are being used by Ryanair in Europe, for public-service-obligation (PSO) or for charter service. Not only would required investments be low, while maintaining all options for gradual expansion and upgrades later on: a clearer market focus and lower cost structure would clearly be more competitive as compared to costly green-field projects. These converted air strips could exist in accordance with concession agreements that stipulate exclusivity rights to PPPs in many metros[2].

Cost structure

Costa et al. (2008) review economies of scale in airport activity: "Doganis and Thompson (1973) concluded that average costs decrease up to 3m passengers and to 5m in other studies (Doganis, 1995)… Results from Salazar de la Cruz (1999), analyzing 16 airports in Spain, show that there are decreasing average costs up to 3.5m and increasing from 12.5m passengers. More recently, Jeong and Vogel (2005) showed that the economies of scale disappeared for traffic volumes between 2.5m and 5m passengers. Empirically it is possible to conclude (sic) that there are economies of scale from the air side until volumes of 20m to 25m passengers. Evidence from airports show that with one single runway it is possible to achieve up to 30m passengers. In what concerns terminal area, it is not possible to identify any evidence of economies of scale. Based on this information, it was developed a theoretical model for the airport capacity expansions and cost per unit."

With reference to available information on project costs for Indian airports, we find that (planned) thresholds for extension of the named Indian airports are in accordance with the economies of scale (for terminal and gate side, etc.) stated above. A modular approach respecting these thresholds may provide for some flexibility when expanding capacity. A second type of threshold may be reached at around 20m or 25m passengers (subject to the number of aircraft movements and other external factors) when constructing an additional runway. The "old" airports at Chennai and Calcutta have 2 runways already, but only 1 of each pair is sufficiently long to serve long-haul, greater capacity aircraft. However, the MIHAN project stands out as very low in actual capacity, very optimistic in forecasted demand while planning for a disproportionate number of runways. Modular expansion and FSP has not prevented such risky projects from getting executed.

[2] Conflicts of interest within the AAI and costly tensions with labour unions are also likely to be reduced.

Demand and revenue side

India's airport charges were considered among the highest among the airports in Asia or the Gulf region. Experts claimed the charges in India to be even higher than in Europe or the US. In 2006, Kuala Lumpur airport charged about $203 for a small Airbus A320 aircraft with a three-hour turnaround time while Indian airports charged four times more at $1,060. In India, airlines paid $2,331 for handling a long-haul flight of a Boeing B777, while Kuala Lumpur airport charged three times less at $753 (see ATRS Airport Report, 2008). Also, international flights had to pay 33% more in airport charges compared to domestic flights. Such discrimination stood in stark contrast to international practice. Although charges in 2008 were fixed, airlines feared that green-field airports would hike these charges once they became operational. "Charges for space rental, including back-up and ticketing offices, to be levied by the green-field airport authorities in Hyderabad and Bangalore are going to be double of what we pay the AAI," an airline official said.

Total passenger fees, airport taxes and fuel surcharges on top of a one-way ticket price typically ranged from Rs.2,800 to Rs.3,450 (for September 2008). This translated to between US-$70 to US-$87. However, the actual passenger usage fee at the airport often did not exceed Rs.225 (US-$5). There had been early signs that regular airport charges or user fees would not suffice to finance investment and operation at many airports under PPP. For example, the new Bangalore airport announced to charge a "user development fee" (UDF) of $22 per (outbound) international passenger. There was a proposal to levy a similar charge on domestic passengers, but this was unlikely to happen as the budget airlines, which were opposed to adding the fee to their ticket prices, had threatened to walk out. By comparison Cochin airport, which had stopped charging for UDF, contemplated about reintroducing it from 2008 on. Other requests came from GMR Infra and GVK Group to hike Delhi and Mumbai airport user development charges by 10% each.

Another source for financing airport development costs came from commercial revenues. Changi airport had planned its budget terminal to be mostly financed through non-aeronautical revenues over a 10-years period. Over 60% of the profits that were made in this new terminal were to come from non-aeronautical activities. Investing into a completely new terminal that may be expanded in a modular fashion could be reckoned to increase revenue streams not only from aeronautical but from non-aeronautical activities as well. In contrast, keeping old terminals operating and investing in low-cost terminals that, too, may be expanded would bring the benefit of lower investment costs. However one may question the impact of such investment on non-aeronautical revenues.

With no information on Indian low-cost airports available, some insights may be gathered by comparing London-Luton with London-Stansted. The first one predominantly caters to LC-carriers, while Stansted does so to a lesser extent. In both cases, the ratio of aeronautical revenues is approximately equal to non-aeronautical revenues (50/50 at Luton, 52/47 at Stansted, see Annual Reports). Private Indian airports will seek 60% or more of their future revenues from commercial activities. At Luton (Stansted), the average passenger spent £3.92 (6.90) on aeronautical charges as compared to his £3.87 (3.27) contribution through commercial/ retail income (in 2006). A similar pattern can be found in Singapore: Changi airport charges a S$-13 traveler fee (S$7 for pax service and S$6 for pax security) at its LC-terminal as compared to the regular S$-21 fee. There, low cost passengers outspent those of FSCs with regards to purchases of alcoholic drinks and liquor. The situation at Kuala

Lumpur's LC-terminal is consistent with these findings (sources are available from the author on request).

## From "real options" to robust air traffic systems

Real options valuation normally uses a discounted cash-flow analysis to assess the well-founding of an investment choice. Coming up with specific numbers for the Indian context not only may be somewhat difficult (with regards to cost structure, etc.), but it is the revenue side that causes even greater concerns: reliable estimates must be made for both aeronautical and non-aeronautical revenues over a 15-20 years time-period or even more. Based on such forecasts and by increasing the ratio of non-aeronautical to aeronautical revenues, almost any investment could be rationalized into becoming economically viable. Problems with such an approach have been outlined above. Not only is the customer base for such forecasts relatively small in India at present (causing unreliable extrapolations into the future), but aeronautical and commercial revenues are highly interdependent as well: less traffic would also drive down commercial results. Moreover, it is obvious that non-metro cities with poorer demographics will not be able emulate such high investments, an important factor to be taken into account in the context of the vast Indian sub-continent. Recent demands for hikes in UDFs (User Development Fees) at many Indian airports show this discrepancy between budgetary planning and reality.

Also, a high percentage of air travellers are known for being very price sensitive: hiking fees at airports is likely to impact on demand. Although on paper Net Present Values may favour one investment choice over another, the impact on the entire air traffic system as such will not be taken into account. More specifically, concession agreements may ask for closing "old" BLR and HYD airports, which would encourage hiking fees and fares at the new airports – but the development and growth of the air traffic system as such would be seriously stifled due to less demand.

We therefore suggest comparing all options that are a priori viable and to determine their potential to induce growth at minimum risk for the Indian air traffic system altogether. Rather than applying a finance-dominated analysis, our approach will contrast three levels of demand (strong, average, weak) for the real options of investment paths that have been proposed before. The idea is to attribute a specific risk/growth combination to each option. In that sense, demand and potential for growth are no longer considered as exogenous, but as partly driven by the investment path itself.

*Centrally located budget terminals at existing airports (1)*
This investment choice would be highly flexible and easily reversible (i.e. through upgrades, etc.). The risk/growth profile would clearly be improved. The budget terminal would act as a hedging strategy to the airport in the case of less demand: rather than losing the market due to high prices, residual demand could still be satisfied due to lower costs. During high demand, expansion of FSC terminals would not be hindered, but expansion at the budget terminal would possibly be even stronger. With low demand, overall capacity would more easily be maintained. From a revenue perspective, this path seems near optimal: aeronautical revenues would grow due to higher attractiveness for LCCs (overall utilization of most airport facilities would be less volatile) and fixed costs (runway, ground handling, etc.) could be shared by different terminals. Aeronautical revenues would become significantly less risky during periods of less demand. In that sense, there would be less dependency on cross-subsidies from non-aeronautical revenue as well. It is noteworthy that commercial revenues could be

maximized as well due to the natural segmentation of customers in different terminal buildings, i.e. products/services and prices at the budget terminal could effectively discriminate to maximize revenues.

*Centrally located "mixed" terminals at existing airports (2)*
The Indian (private) examples of Mumbai and Delhi show no dedicated terminals for LCCs. This may be partly because the number of routes of 'true' LCCs from these airports is very low, and market entry for 'real' LCCs seems somewhat discouraged in India. The disadvantages of such a scenario are the following: no incentive on cost discipline during modernization/expansion works. Shocks in factor costs, i.e. fuel, are not absorbed, but further accentuated through the highly irreversible investment path taken. During periods of medium to lower demand, entire segments of passengers turn away from flying, even so during periods of economic growth. It is true that limited capacity at these airports enhances such an oligopoly situation which will do little to discipline pricing decisions made by airports and airlines. Instead, airlines will cut down on less profitable routes, which in turn will be a cause for less traffic growth (and not be the effect from exogenous price shocks)! Despite of high prices, revenues will not be enough to finance infrastructure investments, with the operator asking for UDF without having completed their planned phase of modular expansion (FSP) in the first place. The only passengers who are willing and able to pay here will be business and international. Non-aeronautical revenues will be exposed to the same systemic risk: during economic weaker times, consumers will spend less on the high priced products, an effect that will be compounded by less traffic. Aeronautical fees in Mumbai and Delhi are already among the highest in Asia, while quality of service (navigation, ground handling, landing & take-off assistance, security, etc.) are among Asia's weakest. In that sense, there is a systemic risk that other airports will take over more high-net-value passengers from these airports in the future. This risk is inherent in the investment path that had been taken. Any decision to expand capacity at such a basis would incur significantly high risk for all the long-term stakeholders involved. It is true that during economic strong growth, maximum returns can be drawn due to local market power and constrained capacity in an auction-like logic.

*New 'mixed' airport constructions (green-field) at the outskirts of cities, with old airports being closed (3)*
It is very difficult to reverse this investment due to its high technological and locational specificity. Compared to Delhi and Mumbai, there are less constraints for capacity expansion. Also, the relative proximity between HYD, BLR, Chennai or Cochin may induce competition for high-net-value passengers, in particular for transit flights. With high demand, all airports should grow and aeronautical revenues plus commercial revenues may be sufficient to finance investment and modular growth. However, this growth will remain dependent on domestic demand which is largely determined by low-cost tickets (including airport taxes and fuel surcharge). The extent to which these airports will be able to cater to low cost carriers will be critical for their growth in uncertain demand. On one side, the construction costs do matter and have been very high compared to dedicated low-cost terminals. This differential is currently burdened on outbound international passengers. This may be a viable strategy as long as there is no competition from the old airports that could remain in operation. Non-aeronautical revenues may cross-subsidize operations, although a dedicated terminal could probably have captured more budget travellers for commercial revenue. The risk lies in the re-opening of old central airports that could provide better value to the time-pressed high-net-value individual. Weak demand (economic slow-down) would significantly handicap modular expansion and the competitiveness of such green-field airports in the long run.

As mentioned before, the success story of Cochin airport could be regarded as an exception to this rule: One, its capacity amounts to 2,5m Pax in 2007 which puts it at the lower end of the scale of investments discussed. Secondly, a strict cost discipline had been exercised throughout the project. Thus, the airport is likely to at the least defend its competitive edge as it grows in a very balanced way (as compared to other, bigger airports in the same category), while being able to cover operational costs to a large extend through aeronautical revenues. Non-aeronautical revenues can be considered more of a supplement and would render Cochin even more profitable. This successful combination seems very robust to withstand economic slow-downs due to its greater cost effectiveness and conservative approach to expansion in a very focused customer segment (international, no-transit).

*New 'low-cost' airport constructions (green-field) at the outskirts of cities, with old airports remaining open (4)*
This solution could provide the best of both worlds: easy access and great connectivity from the city center for high net value individuals. Selected transfer flights for long distance would also be conceivable from that central location, as seen at other airports. The old airport could easily be modernized to cater to the specific needs of this segment of customers. The low-cost terminal at the outskirts could be constructed at a fraction of the usual costs and would offer significant cost advantages to carriers and passengers alike. Such satellite solutions may cater to the specific needs of budget travellers. Due to the different target segments, there would be little competition, while commercial revenues would be maximized. A strict focus on low-cost flights that would exclude long-distance or the use of very large aircraft could keep investment costs down and provide LCCs with a competitive advantage. These facilities could be expanded in a modular fashion and would be more likely to grow during economic slow-downs as compared to mixed facilities - even when central airport operations may suffer. There are, however, few examples of such airports. One reason may be costs for separate runways and additional facilities that come with it, although LCCs do not require gates. As long as aeronautical revenues can cover these investment costs, in particular the green-field case, the project would be feasible. With non-aeronautical revenues aimed at contributing more than 60% to airport profits, effective customer segmentation through different locations may be very effective. This option could apply to airports in Chennai or Calcutta, where PPPs at a point in time had been discussed while AAI would continue to operate from central airports in the same city.

*Conversion of existing airstrips at the outskirts of cities (5)*
In theory, the above option (4) could also be extended to the modernization of former military airstrips in India. This is what happened at airports in Europe, where Ryanair privileges secondary airports and continues to increase both new routes and demand for them, despite higher fuel prices and economic slow-down. This choice has been shown to be totally insensitive to the operation of central airports or not. Smaller aircraft, charter service as well as regional feeders could also serve such airports. Low fees to the airline and to the customer as well as shuttle service to the city center would enable such smaller capacity airports to grow, although their overall volume would not in all cases reach that of (4). The advantage of this solution is the potential to develop a spatially balanced and comprehensive network of routes that are economically viable with very low investment costs. There would be little dependency on commercial revenues to cross-subsidize aeronautical operations. Instead, LCCs and other carriers may seize such opportunites to generate incremental revenue onboard.

## Results

It was our intention to show alternative paths for airport development in India. These alternatives feature distinct properties in terms of competition and resilience to shocks in demand as well as (in)dependence on commercial revenues to finance aeronautical operations and their growth. By comparing alternative 'real options' and their plausible impact on market structure and competitive dynamics, a hierarchy of optimal versus sub-optimal solutions emerges.

**Figure 2**
**Optimal paths for planning and investing in airport development in India**

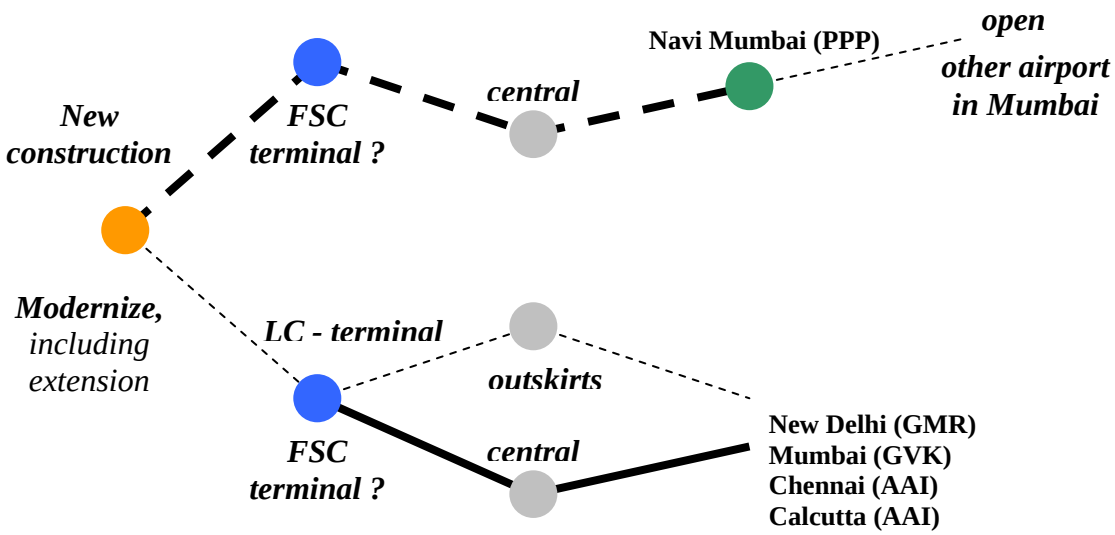


Figure 2 shows modernization of existing facilities can provide for cost-effective and flexible solutions when compared to new green-field projects. Rather than committing to highly irreversible investments at (centrally located) metro airports, dedicated low-cost terminals would offer more robust and resilient solutions with regards to market competition and uncertain demand. In the case of airstrips that are close to existing metros, it may be a highly flexible and very competitive complement to have them upgraded for low-cost, charter or regional connections. Such low-intensity satellite solutions could decongest the existing airports and help them focus on high-value added business or international travellers instead. Upgrades there could be more focused and capacity expansion would become less urgent.

In the case of constructing completely new infrastructure (green-field) aimed at full-service and low-cost carriers alike, our analysis shows such an approach to be seriously flawed and sub-optimal when compared with other 'real options'. The lower branch of Figure 2 (modernization/upgrade of existing facilities) presents clearly superior cost/benefit, including risk/reward in an uncertain environment. Experience has shown in the case of new Bangalore airport that stakeholders do not hesitate to commission new, i.e. more optimistic, forecasts if original ones prove too conservative for justifying planned expenditures. Also, clauses in these concession agreements for green-field projects clearly inhibit market competition and thus the possibility for more cost-effective and flexible infrastructure to emerge in the same

catchment area. During times of uncertain demand, these types of investments will be less adaptive to change and will be a major source of inefficiency in the market. Exceptionally successful projects such as Cochin airport demonstrate that growth from small scales, with relatively modest investments in the beginning, but a clear customer focus and market segmentation are the way to do green-field projects.

Our analysis may also suggest modifications in strategic planning for larger scale green-field projects that are underway in central locations such as Navi Mumbai. Current plans there go for mixed terminals that would cater to low-cost carriers and FSCs alike, possibly admitting even international traffic. There is no doubt about the commitment and irreversibility of investment that is to be undertaken there. However, continuing operations from the existing domestic and international terminals may deter some private parties from bidding for Navi Mumbai, in particular during periods of economic uncertainty. Thus there are significant risks in such a project, despite of its central location and state of the art technology that will be implemented there. In a clear distinction to typical PPPs for green-field projects in India, we would therefore recommend to go the way of flexibility in the case of Navi Mumbai. The new airport could be conceived as a dedicated low-cost terminal, while its budget could be reduced to a fraction of the initially planned investment. Customer segmentation with the remaining two Mumbai airports would fall in place, while Navi Mumbai should aim to finance its aeronautical activities without having to depend on cross-subsidies from commercial activities. This change in investment path from irreversible to lower costs will enhance more flexibility in the usage of airport capacity and its expansion will show a better reward/risk trade-off in the long run. It would contribute to help grow air traffic in India in a more balanced and robust way. Issues of ‘Flexible Strategic Planning’ can be instrumental to implement such growth from an operational perspective at the airport level.

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