5TH JULY 2017

GMR GOA INTERNATIONAL AIRPORT LTD (GGIAL)

TRAFFIC REPORT

GREENFIELD AIRPORT AT MOPA, NORTH GOA

MASTERPLAN – VOLUME THREE

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Contents

Traffic Forecasts

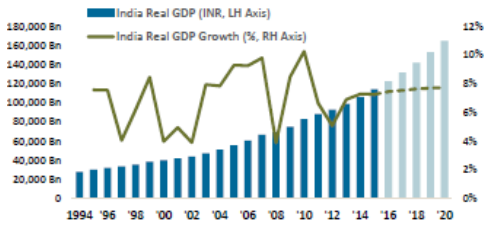
ICF London was commissioned to develop a Detailed Traffic Report for the Airport. Based on this traffic report a matrix has been developed of all years 2020-2057 with traffic numbers, growth, peaks and ATMs. This Report was used as the basis for the development of the Master Plan for the Airport. Key highlights of the Traffic Report are summarised in this volume

1.1 India GDP and Population

The Indian economy has seen exponential growth since the turn of the century with Real GDP increasing at a CAGR of 6.9% between 1994 and 2014. India has not recorded a Real GDP
growth rate below 3.9% since 1994.

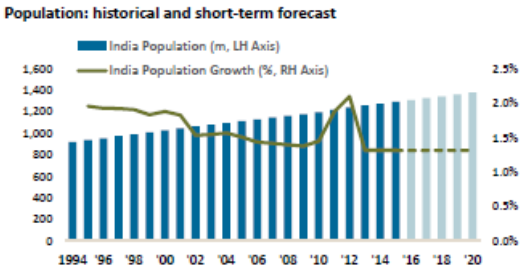
India is now the world's 3rd largest economy according to the IMF in terms of GDP at Purchasing Power Parity (PPP) values, behind the USA and China. The IMF World Economic Outlook forecasts India's GDP to grow at a rate of approximately 7.6% per annum between 2015 and 2020. This is considerably higher than the short term forecast for China (6.3%).

Real GDP: historical and short-term forecast



India's vast population (1.25 Bn in 2014) has maintained growth of approximately 1.4% since 2003, adding an annual population larger than that of London's metropolitan area. Forecasts expect India's population to continue growth of approximately 1% over the next five years. Additionally, India's middle class is estimated at around 74m – while this ranks as one of the largest middle class populations in the world, it accounts for just 5% of the total population. Experts expect this middle class to grow significantly over the coming years –

Euromonitor project the middle-class population to exceed 90m by 2030.

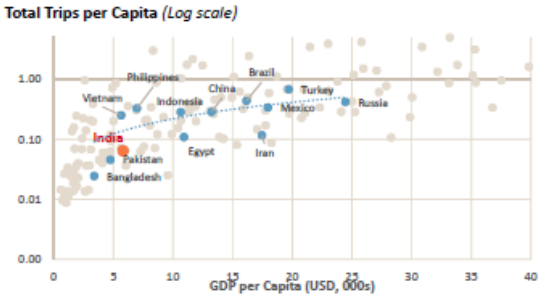


Source: ICF Traffic Report based on IMF World Economic Outlook, October 2014

Despite the high population growth, falling prices have meant that GDP per capita in terms of PPP has grown at a faster rate than India's GDP – 7.3% compared to 6.9% CAGR over the past two decades. Despite this, India's GDP per capita is currently around $6,000 (PPP) – a world ranking of just 125. This is comparable to countries like Vietnam and Nigeria, and significantly lower than
that of China ($13,000).

GDP per capita can be a useful measure of spending power and as such is related to the propensity to fly, although there are numerous other factors (including geography) that will also contribute to the size of the aviation market.

India's propensity to fly is 0.06 trips per capita, relatively low compared to some peer nations (e.g. Vietnam's propensity to fly is 4x higher). As India's GDP per capita increases so will its propensity to fly. For example, China - with a GDP per capita almost twice as high as India – has a propensity to fly four times higher than India. Income inequality is also a significant consideration when sizing the potential aviation market. India's latest Socioeconomic and Caste Census (SECC), which surveyed 300m households, found that 73% live in rural areas, and 75% earn less than 5,000INR per month. There are still clearly many millions of Indians who cannot afford to fly.



Source: ICF Traffic Report based on data from IMF WEO, October 2015

1.2Aviation Policy

While the Government of India has publicly committed to growing the aviation market, many controls and issues still remain. Key aviation policies across India are summarised below:

5/20 rule

- Indian regulation specifies that for a domestic carrier to operate international routes, it needs to have been operating for 5 years and have a fleet of at least 20 units
- This policy is naturally unpopular with new airlines who are prevented from opening international routes, and there is considerable pressure on the government to repeal the rule. However, support from established carriers has slowed progress

Tax on aviation fuel

- Unusually, India charge tax on aviation fuel which results in larger fuel bills for Indian carriers relative to carriers from other parts of the world
- In the 2016 budget, the aviation fuel tax was increased

Bilateral Agreements

- Traffic is governed by bilateral agreements on some of the largest international markets from India. The bilateral agreement between India and the UAE for example, has been virtually exhausted from both sides

Route Dispersal Guidelines (RDG)

- Currently under review is the RDG for scheduled operators which states that for an airline to operate between Tier I cities they must

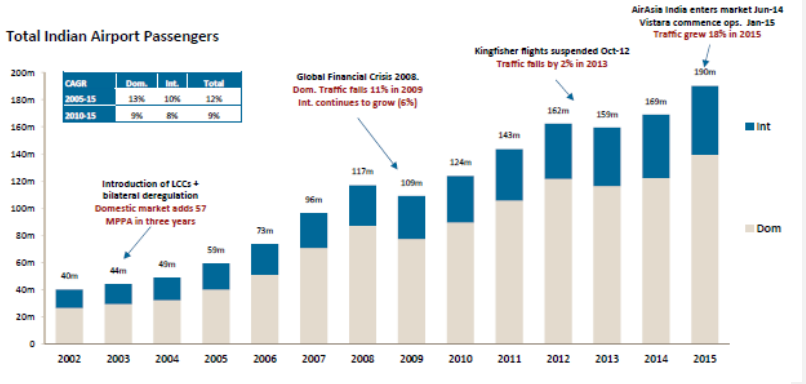
also deploy a proportion of their total capacity on lower Tier cities and to certain remote regions

Aviation policy – building out tier 2/3 airports etc. Intent on growth

- The Indian government, as part of its aviation policy, has committed to developing tier 2 and tier 3 city connectivity
- A number of new airports are being planned and policies exist to support carriers operating thin regional routes (roughly equivalent to PSO routes)

Additionally, Indian carriers have historically struggled with profitability. While the current climate of low fuel prices will help reduce losses on operations, fundamental changes to the fixed cost base will be required across Indian aviation to maintain long-term profitability.

Despite these challenges, liberalisation and the advent of the 'no-frills carrier (NFC)' has transformed the Indian market in the past decade with the NFCs driving growth across India.



Source: ICF Traffic Report based on AAI Data

India clearly has enormous potential, but there are inherent risks as outlined below. One of the main threats has been the issue of infrastructure constraints and the risk of not being able to meet the latent demand that is clearly present across the nation and especially in markets such as Goa.

India SWOT/Overview

Strengths

- Large population
- Fast growing economy
- Government commitment to developing aviation industry through PPPs

Weaknesses

- Struggling airlines
- Income inequality means many Indians cannot afford to travel
- Protectionist policies

Opportunities

- Continuing economic growth will drive increases in disposable income and lift many millions of Indians into the middle classes, enabling a huge increase in first time fliers
- Population growth will drive more flights
- Burgeoning tourism markets (both inbound and outbound)

Threats

- Carrier bankruptcy
- Fuel price growth could reduce the ability for airlines to grow profitably
- Infrastructure constraints are not addressed

1.3Goa Market

Goa is a state in Southern India, surrounded by the states of Maharashtra and Karnataka. The state capital is Panjim. Goa is split into two districts – North and South Goa. Each district is further divided into Talukas (shown on the map below). The Proposed Goa Airport at Mopa is located in the Pernem Taluka in North Goa.

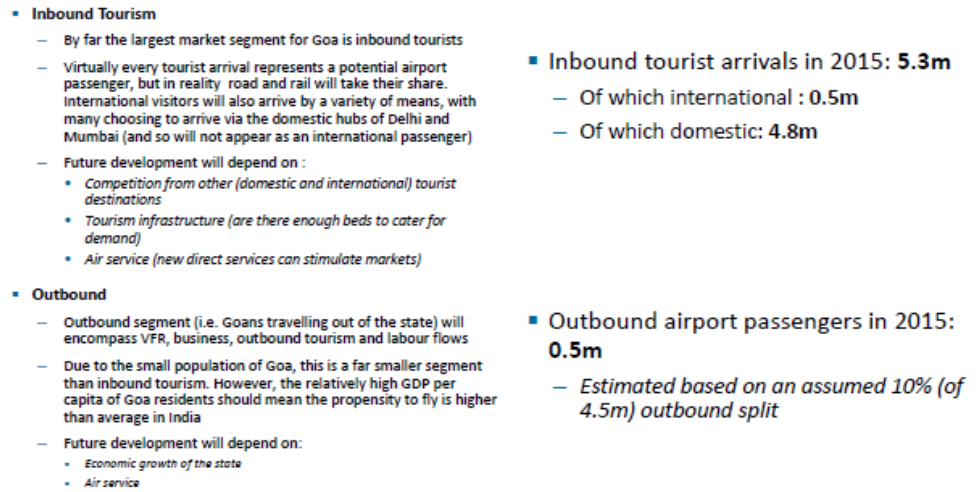
Source: IMF WEO, October 2015 and CIA World Factbook

Goa is the smallest state in India, encompassing an area of 3,700m2. The state has a coastline of approximately 100 km. Goa's population of 1.5m makes it the fourth smallest in India. Goa has seen strong population growth with almost an additional 300,000 residents over the past 20 years. The population is broadly equally divided between North and South Goa, with 56% of Goans living

in North Goa. Goa's economy is heavily reliant on its tourism market which first came to the international spotlight in the 1960s where it became famed for being a liberal place to enjoy golden beaches, warm weather and music. The coastline is the key focus of tourism activities, with the South focusing on quieter, more premium holidays compared to the busier, higher volume resorts in the North.

Goa's NSDP per Capita is the highest in India, besting both Delhi and Maharashtra. However, the overall size of Goa means its total economic power is amongst the lowest in India. Besides tourism, Goa's other industries consist of mining, agriculture and fishing. Goa is a major source of iron ore and produces 18% of India's total output.

Goa has a thriving inbound tourism market, and its relatively high-income residents are key in driving outbound travel. A summary of the market segments are outlined below.

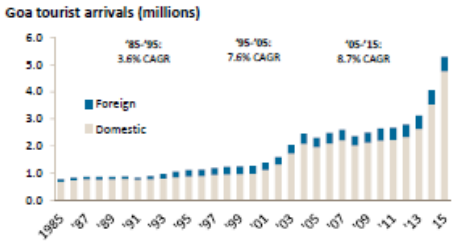


Source: Goa Department of Tourism

Goa received over 5 million tourist arrivals in 2015, the majority of which were domestic. There was very little growth in tourist arrivals in Goa between 1985 and 2000, mostly a result of a stagnant domestic market. The growth in arrivals in the early 2000s corresponds to a period of liberalisation of the aviation market. Following a period of steady growth between 2005 and 2012, tourist arrivals grew rapidly in both 2014 and 2015 registering annual growth rates of 30% and 31% respectively. One of the reasons for this growth in 2014-15 according to the Department of Tourism was apparently the presence of Goan sites in famous Bollywood movies.

- Domestic tourists account for 90% tourist arrivals
- The key international markets are Russia and the UK, followed by France and Germany

- Russian and British tourists account for over half (58%) of foreign
tourists in 2014
- UK tourists have been fairly steady over the past 5 years. Russian tourists have increased rapidly from a base of just 30,000 in 2005 to 150,000 in 2014. Russian arrivals have decreased recently due to the depreciation of the Ruble
- German arrivals have seen strong growth in the past few years and now account for 11% of all arrivals, the third largest nationality
- French tourists are also starting to visit Goa in larger numbers, with arrivals 76% higher in 2014 than 2012

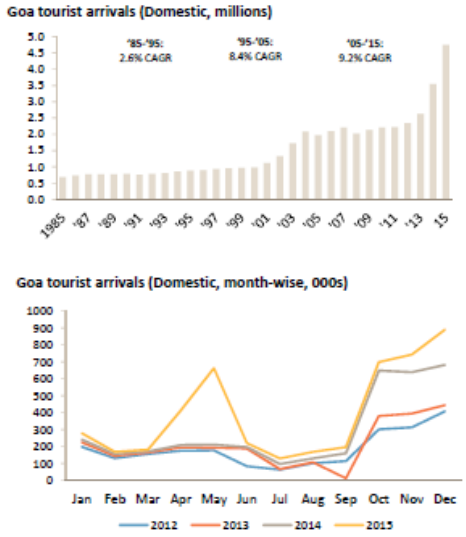


Source: Goa Department of Tourism

Goa's domestic tourism market as grown at over 30% p.a. over the past two years. Key features of the domestic tourist market are summarised below:

- There were 4.8m domestic tourist arrivals in Goa in 2015
- The domestic tourist arrivals is well-correlated to developments in air service, with the growth in the early 2000s and in 2014-15 both following expansion in air capacity to Goa. Whilst it is always hard to disentangle the supply and demand-side factors, the data does suggest that there are domestic markets that can be stimulated with additional service
- There is a clear seasonality to domestic arrivals, with the domestic season peaking significantly between October and December. During these months, visitors are up to 3x as high as in the off-peak months
- June to September is the monsoon period, and during this period visitors to Goa are at their lowest

- May 2016 showed an unprecedented peak in domestic tourist arrivals. It is unclear at this stage what is driving the peak in arrivals in May, and given the 2015 data is still provisional we have not assumed this to be an indication of trends to follow
- The significant growth in domestic tourist arrivals in 2014 and 2015 has occurred primarily in the peak months

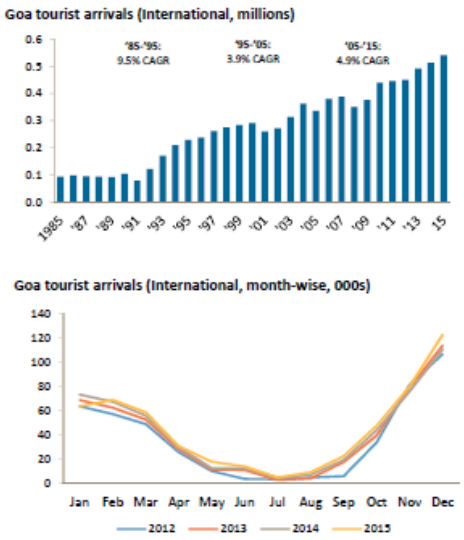


Source: ICF Traffic Report based on info from Goa Department of Tourism, 2015 data is provisional

Goa's international tourism market as grown at a more gradual pace, averaging 4.4% p.a. over the past two decades. Key features of the international tourist market are summarised below:

- There were over 0.5m international tourist arrivals in Goa in 2015, a growth of 5.4% vs 2014
- Unlike the more sporadic development in domestic tourists, following an initial period of high growth in the mid 90s, international tourist arrivals have grown steadily at between
4 and 5% p.a.
- The peak season is slightly longer for international tourists, extending across the whole winter season (though likewise with domestic markets, it peaks in December). There are

- virtually no international tourists in the summer season, in part due to the monsoon period, but also due to competition from beach resorts closer to home (i.e. in Europe)
- The seasonal profile has remained consistent for the past four years, and is unlikely to change for as long as the main markets continue to be European-based



Source: ICF Traffic Report based on info from Goa Department of Tourism, 2015 data is provisional

In addition to the tourism demand and traffic, the other factor affecting growth in the Goa Metropolitan region is the availability of tourist accommodation. A summary of existing hotel capacity is provided below:

- There are over 3,000 hotels located in the state of Goa, with over 55,000 beds
- Of these 3,000+ hotels, 63 have star categories, including 24 with a 5-star rating
- The majority of hotels are located in North Goa, above Panjim in the stretch of coast between Candolim and Anjuna. The coastline in Pernem (where Goa Mopa is) is relatively undeveloped
- There are several large/premium airports located in South Goa including the Park Hyatt and Taj Exotica. There is local resistance to

overdevelopment in the South in order to retain its premium, quieter ambience

In addition, there are five new hotels planned for Goa in the near-term; and the Department of Tourism anticipates more development near the site for the Airport in Mopa. However, hotel bedstock is already highly utilised, and will limit the number of tourist arrivals that Goa can accommodate currently. A summary of hotel room utilisation is provided below:

Goa Accommodation Offerings

Category	No. of Hotels	No. of Rooms	No. of Beds	Avg. Beds/Hotel
A	81	6,967	11,676	144
B	234	7,817	13,991	60
C	448	6,652	12,276	27
D	2,489	9,769	17,867	7
Total	3,252	31,205	55,810	17
Star Category Hotels	63	5,362	10,001	159

Source: ICF Traffic Report based on information from Goa Department of Tourism, Tripadvisor.com

- At 100% utilisation, Goa can accommodate some 50,000 visitors
- According to the Department of Tourism, hotel room utilisation is between 50% and 60% in the off-peak season, and between 97% and 100% in the peak season. In peak weeks and peak weekends, hotel rooms regularly sell out
- Across the year, this equates to around a 70% occupancy rate for Goa, which is consistent with figures compiled by STR Global. data as shared by real estate consultant C&W in their report, and assumptions used by traffic consultant ICF attached as Annexure A
- Despite the pressing hotel capacity constraints in peak periods, there will be scope to grow tourist arrivals through attracting more tourist arrivals in the off-peak months. This was also mentioned during our interview with the Department of Tourism in which they stated that one of their key targets was attracting more visitors in off-peak months

In summary, Goa represents a well-established tourist destination with a robust outbound market, with hotel supply being a major factor for long-term growth. A SWOT analysis of the Goa Tourism Market is provided below.

Strengths

- Prime tourism market, with high international and domestic awareness
- Planning policy in place to protect the area's most important asset – its natural beauty
- Relatively well-off local population can drive outbound volumes

Weaknesses

- Congestion in North Goa
- Difficult to attract visitors in monsoon season
- Hotel capacity nearly fully utilised in peak periods. Limited potential for new sea-front properties
- Resorts linked by busy, narrow roads
- Dependence on limited number of international tourist markets

Opportunities

- Attracting more visitors in off-peak months (e.g. via attracting MICE and weddings segments)
- Developing new resorts in less-developed areas of Goa
- Diversification away from traditional beach resort type holidays (though this will be challenging)

Threats

- Increased competition from other tourist destinations (both domestic – e.g. Kerala – and international – e.g. Thailand)
- Inability to grow hotel accommodation capacity to meet demand

1.4Goa Aviation Market

1.4.1 Dabolim Airport Overview

Despite recent investment, Dabolim Airport remains restricted by its colocation with the Indian Navy. Key features of the Dabolim Airport are outlined below:

- A 3,400m x 45m Code-E capable runway
- Apron capacity of 9 aircraft (7 Code C + 2 Code E) currently
- A passenger terminal building of approximately 62,000m2 and a terminal peak-hour passenger (PHP) capacity of 2,750 passengers, equating to an annual capacity of approximately 8-9 mppa
- Restricted usage periods between 0830 – 1300 on weekdays

Most critically, there are significant restrictions on operations between 0830-1300 on weekdays. In addition, all operations are still heavily dictated by the Indian Navy. Despite attempts to develop this airport by the AAI, the Navy has been very reluctant to grant permission. This is expected to continue given the geo-political concerns in the region currently. The location of the airport though makes it well positioned to serve Panjim, South and North Goa if there were no restrictions.

As outlined earlier, Dabolim's terminal has a design capacity of between 8 and 9mppa. However, there is some debate as to whether the airport can actually achieves these levels of throughput.
Dabolim's 62,000sqm terminal equates to 7,300 sqm per mppa, which is comparable with other Asian terminals such as those at Gimpo airport in South Korea and Jakarta in Indonesia.

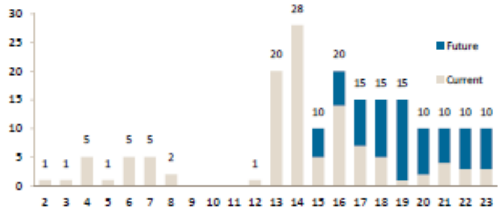
From first-hand experience as well as comments from key stakeholders, it is clear that the design of the terminal is not optimal. The extent to which this would impact capacity of the terminal is unclear. However, it is possible that in the longer term, and given the sufficient footprint, the internal layout can be improved.

Additionally, Dabolim's airside capacity could conceivably accommodate ~8.5 mppa if there were no further operating restrictions. However, even so, Dabolim has a number of potential airside restrictions related to its infrastructure, including a lack of parallel taxiway and no rapid exit taxiways as well as a limited number of stands. The airport's operating hour restriction will also impact its long-term capacity potential.

Dabolim has 9 stands, which would typically limit the airport to between 18 and 22 ATMs per hour. We note that they are scheduling up to 28 in the peak hour, but it is understood that this is causing ongestion and delays. The hour after the peak-hour is noticeably quiet, and it is likely that is necessary in order to recover. The lack of RETs and a full length parallel taxiway will limit how many movements the airport can accommodate. As a conservative assumption a maximum of 20 movements per hour (this is already scheduled in the 1pm hour) seems achievable. It is worth noting that other airports have achieved considerably more with similar infrastructure – London City airport has neither RETs nor a parallel taxiway, but can achieve a runway rate of 38 movements per hour, albeit with smaller aircraft types. The chart below shows a typical busy day profile, and a conservative assessment of what a maximum use profile would look like, in which we have assumed no growth in the morning period, and a throughput of 10-15 movements per hour in the evening/night-time period

Without any changes to the seasonal profile and the passenger loading, this could deliver passenger volumes of 7.8m. By increasing the passenger loading to 150 P/ATM the airport could achieve over 8.5mppa. Further de-peaking could increase this number further, but all of this is predicated on airlines being able to change their fleet mix, increase load factors significantly and operate a schedule that works for passengers and customers.

Typical Scheduled ATMs by hour at GOI (Friday in Nov-15, Charter excluded)



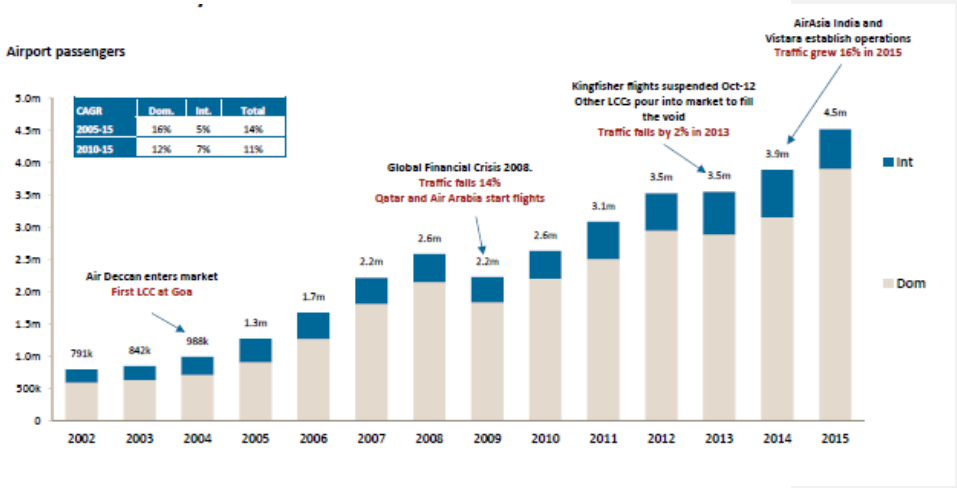
High level capacity scenarios for GOI

	Today	Max. Use	Max. Use (150 P/ATM)
Busy day ATMs	113	183	183
Busy day/Average day	15%	15%	15%
Annual ATMs	33,422	57,937	57,937
Passengers/ATM	135	135	150
Annual Pax (mppa)	4.5	7.8	8.7

Source: ICF Traffic Report based on OAG data

1.4.2 Goa Traffic

Goa has enjoyed strong international growth, but the domestic market has grown twice as fast more recently.



Source: ICF Traffic Report based on AAI data

1.4.2.1 Domestic Market

Indigo (6E) dominate the domestic market and capacity is concentrated on Delhi and Mumbai. However, despite the number of schedule departures increasing almost 3x in the past ten years the number of routes served from GOI has only increased from seven to nine. Mumbai has grown the most in absolute terms while Delhi has seen the strongest percent growth. Bengaluru has also seen strong growth. Hyderabad, Pune and Chennai have all experienced roller-coaster like service with all three markets experiencing strong growth followed by cutbacks at least twice in recent years. The 'other' markets served from Dabolim are largely Ahmedabad and Kolkata in recent years but previously consisted of Kerala destinations such as Kozhikode and Kochi.

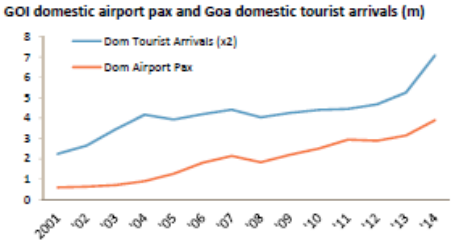
IndiGo is now the dominant carrier at Dabolim with a third of all domestic seats, more than twice the second largest carrier (SpiceJet). The collapse of Kingfisher has allowed for the growth of other LCCs such as IndiGo, SpiceJet and GoAir who now have over 60% of the domestic market. Despite the merge of Indian and Air India the overall market share has fallen from 17% to 13% over the space of five years. Jet Airways has also lost market share to the LCCs, once the second largest carrier Jet is now the fifth largest domestic carrier at Dabolim.

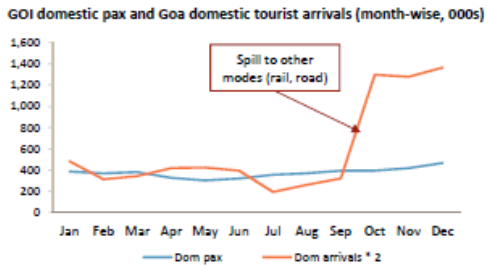
According to the IATA PaxIS, OAG and ICF analysis, Jaipur is the largest unserved market from GOI with almost 40,000 pax in 2015, while the other top markets to be unserved are also predominately northern and western India with some southern markets also requiring passengers to transfer to get to Dabolim.

Almost a million passengers flew indirect to Goa with over 50% using Mumbai to transfer onto Goa bound flights. The top markets via Mumbai are typically already being served directly from Goa but there are still some sizable markets which remain unconnected such as Jaipur, Nagpur and Kochi. Due to Mumbai's capacity issues, it may be that airlines begin flying more services
direct to Goa from these locations. It would therefore seem as if the future growth in the Goa Market is likely to come from direct services to Tier II cities, a market many of the 'no-frills' carriers such as IndiGo are poised to exploit.

Additionally, it is important to examine the issue of modal choice with respect to the domestic market in Goa. For many domestic markets, rail and road are a viable option to air. The modal share on such routes will depend on a range of factors including price, air service quality (frequency, airline) and journey length.

Domestic tourist arrivals greatly outnumber domestic airport arrivals, indicating a significant
share of domestic arrivals by other modes. Since the early 2000s the gap between tourist arrivals and airport passengers has been closing. This is a result of a number of factors, including growth in outbound travel, but likely most important will be a shift away from road and rail to air travel. This is no doubt a consequence of the expansion in low cost air travel that has been ongoing in India since the early 2000s.





Source: ICF Traffic Report based on information from Government of Goa and AAI

Viewed at a seasonal level also reveals a significant difference in the seasonality between domestic airport passengers and the seasonality of domestic tourist arrivals. It is clear that in the winter months, demand for domestic travel to Goa far outstrips the domestic air capacity.

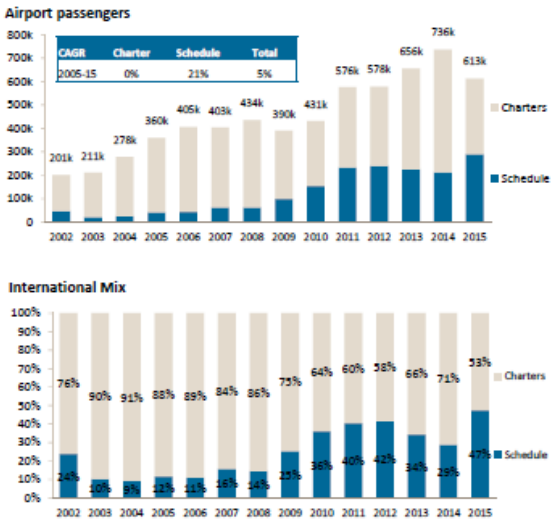
It is therefore likely that capacity/operational constraints at Dabolim are preventing airlines from ramping up capacity in the winter months to take advantage of the high levels of demand

1.4.2.2 International Market

The number of Russian tourists have declined markedly following the fall in Ruble values and the collapse of the Russian carrier Transaero, which has adversely impacted traffic at Dabolim. Charter passengers have barely grown over the last 10 years, with growth being driven from scheduled services (up 21% over the past decade). International volumes dipped 17% in 2014/15 largely as a result of fewer Russian charters due to the fall in value of the Ruble.

German and French tourists have begun to visit Goa in greater numbers in recent years which has dampened the Russian decline. Despite the influx of schedule capacity from the Middle East, the number of Gulf

nationals visiting Goa has seen modest growth, implying that the Gulf is predominantly an outbound market or serving those from further afield.



Source: ICF Traffic Report based on information from Government of Goa

In 2015, the proportion of charter passengers was only 53%, its lowest share since at least 2002, and a 10% drop year over year, primarily caused by the collapse of Transaero and the withdrawal of UK charter Monarch from Goa. On top of the decline in Russian currency local tourism bodies state that there is increased competition for European tourists from Sri Lanka, Mauritius, Vietnam and the Maldives.

Schedule departures from GOI have increased dramatically over the past 15 years with most growth occurring between 2005 and 2011, in a period where several middle eastern routes were opened and expanded. A significant amount of passenger volumes at Dabolim come from Europe but these passengers are typically served by charter operators which do not report all their flying to OAG/IATA schedules.

The largest market served regularly is now Doha which started services in 2009 and has maintained daily services since. Muscat is a recent addition which started in April 2015 with
4x weekly flights and has already started daily flights out of Dabolim in 2016. Jet's partnership with Etihad has also seen the addition of Abu

Dhabi services which look set to grow as Jet continues to focus its international efforts on serving Etihad's hub.

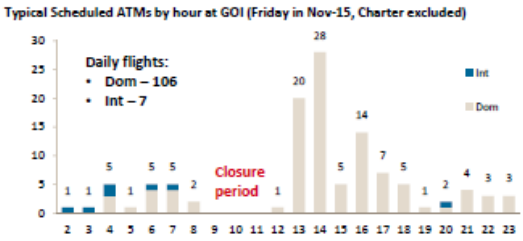
Indian airlines once dominated international markets out of Dabolim but has since merged into Air India, who has maintained a large international presence albeit with slightly less market share. As discussed earlier, the collapse of Transaero has seen the Moscow market become entirely reliant on charter flights as of October 2015.

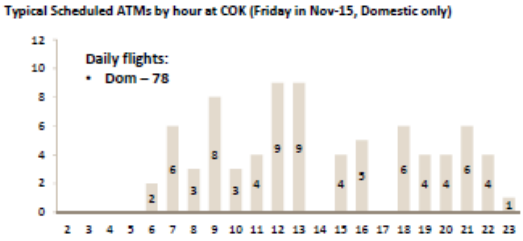
1.4.2.3 Operating restrictions at Dabolim Airport

The enforced closure period has restricted airline growth at Dabolim and put additional strain on operations and infrastructure. Goa Dabolim is closed on weekdays to commercial traffic
between 0830 and 1200. This would otherwise be core operating hours for the domestic markets, and has resulted in a bunching of movements in the hours immediately after the closure period.

The charts overleaf show a more typical daily profile for domestic flights (for Cochin International Airport in Kerala) – there is a much more even spread of traffic throughout the day. Airlines estimated that in the absence of these operating restrictions they could/ would add 25-30% more capacity to the market. These restrictions can also hamper the connecting options upstream. For example, international arrivals at Delhi and Mumbai typically arrive early in the morning. With very few morning flights to Goa, passengers face a long lay over until the first wave of afternoon flights (typically departing DEL/BOM at around noon).

In addition to restricting the capacity available to airlines, the bunching caused by these restrictions also have implications for congestion and delay at Dabolim. Numerous airlines complained about poor on-time performance, particularly in the peak early afternoon period. Additionally, the Department of Tourism reported that runway resurfacing works in summer 2016 resulted in an even longer closure period (10am – 4pm) at times causing even more schedule perturbation.



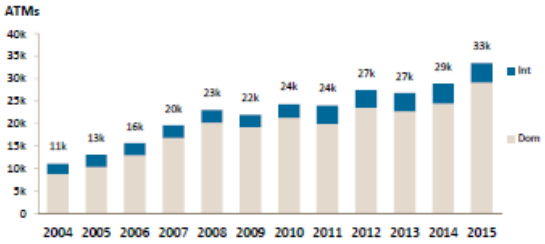


Source: ICF Traffic Report based on OAG data and airline interviews

1.4.2.4 Air Transport Movements (ATMs)

Dabolim Airport handled approximately 33,000 ATMs in 2015. ATMs have seen strong growth over the past decade with domestic movements seeing the largest increase. After experiencing strong growth from 2004 to 2008 Dabolim has seen more sporadic growth with several years of relatively flat performance followed by an spike in 2012 which again was followed with a couple years of steady growth.

2015 saw strong growth with over 4,500 extra movements despite experiencing a 3% drop in international movements, largely caused from fewer Russian charters. A summary of historic ATMs is provided below.



Source: ICF Traffic Report based on AAI data

1.4.2.5 Air Cargo

Dabolim Airport handled approximately 4,500 metric tonnes of cargo in 2015. Cargo volumes at GOI have been fairly constant over the past decade with a period of volatility between 2010 and 2013 where volumes fell by 22% after peaking in 2011.

The market is not served by any dedicated freighters with all cargo being carried as belly cargo. A summary of historic cargo performance at Dabolim is provided below. International cargo volumes have grown in the last five years, while domestic cargo volumes have remained stable.

International cargo was historically inbound up till 2004 but Goa has since become primarily an outbound cargo market. Most goods out from Goa consist of seafood, cashew nuts and pharma goods, all of which are largely perishable and require rapid transit. This however is made more difficult by the fact that Goa's Custom and Excise building is located 25km away from GOI in the centre of Panjim and goods must first be processed there before heading to the airport.

Discussions with Jeena, an international freight forwarder, implied that 90% of cargo from Goa that is destined for international markets does not pass through Dabolim, instead the goods are transported by road/rail to Mumbai and then transported internationally. Jeena also stated that they had previously had facilities in Goa but closed them down recently due to lack of demand which they believe was unlikely to increase much in the future.

The domestic market has also been highly volatile at Dabolim with the past two years remaining fairly static after volumes fell dramatically in 2013. Comments made by Blue Dart, the leading domestic cargo operator, suggest that the market is well served by bellyhold capacity and that airport restrictions do not currently impede growth.

Blue Dart also stated that some of their key clients are situated in North Goa, which makes Mopa an attractive option; however, they also stated that they have significant infrastructure located close to Dabolim which would influence their decision in staying at Dabolim.

1.4.2.6 SWOT Analysis of Dabolim Airport

In short, Dabolim enjoys a convenient location, but suffers from significant operating restrictions that only look as if they are going to worsen given geopolitical issues in the region and the Indian Navy's need to expand operations at their base. A summary of the SWOTs at Dabolim Airport is provided below.

Strengths

- Central location well-suited to accessing both North and South Goa
- Relatively cheap to operate from
- New terminal

Weaknesses

- Operating restrictions significantly restrict airline's ability to serve Goa to extent they would like
- Poor on-time performance
- Airport management not very engaged, administrative burden of having to deal with both AAI and the Navy
- Surface access to resorts via narrow and congested roads
- Poorly designed terminal

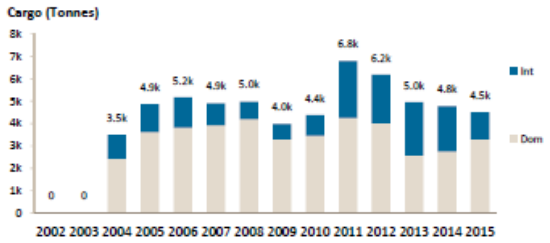
Opportunities

- Any decrease in presence of the Navy and the associated operating restrictions would provide potential to grow traffic

Threats

- Competitive alternative airport…
- Further encroachment/restrictions from the Navy

In addition



Source: ICF Traffic Report based on AAI data

1.5Proposed Airport at Mopa

The Proposed Airport at Mopa is planned to open in 2021 and will compete for commercial traffic with Dabolim. Airport construction is due to start late 2016 after the acceptance of a bid in summer 2016, with the airport due to open in 2021. The airport will be fully commercial and operational 24 hours a day, without flight restrictions experienced at Dabolim Airport.

Goa Mopa will be operated concurrently with Dabolim which will continue to operate as is. The CA states the airport should be fully A380 compliant and able to handle 4.4 mppa upon opening with capacity ultimately growing to 13.1 mppa at least. There are also plans to develop a commercial area next to the airport which can be developed into hotels, offices and other commercial buildings.

In addition to the highway developments planned by the State Government, there will be an expressway connecting the airport to the nearby NH17 highway.

- Goa Mopa is situated in the far north of Goa, but will be located close to the main North-South highway in Goa
- It will be located about 8km from the NH17 in Mopa within the Pernem Taluka
- It will be connected to the NH17 Highway which runs from Mumbai to Panjim (and beyond) via a 4-6 lane expressway (constructed as part of the airport concession)
- Goa Mopa will also be well located to provide connectivity to residents of nearby districts in Southern Maharashtra
- The districts of Sindhudurg and Kolhapur in Maharashtra border Pernem and contain almost 5m residents
- Competition may arise for this local demand upon completion of the planned Sindhudurg airport

- For the resorts in the North Goa district, Goa Mopa will generally be better located:

- For the popular resorts of Candolim, Calungute and Baga in the Bardez taluka, the journey time will be reduced by between 15 and 30 minutes compared to Goa Dabolim
- For the far North resorts in Pernem (a small share of arrivals now, but there is expansion planned), Goa Mopa will considerably closer than Dabolim – journey times could be reduced by around an hour
- For Panjim and surroundings, the travel time will be roughly the same between the two airports
- For the South Goa district, Goa Mopa will be at a disadvantage:
- Salcette – where the majority of the resorts are located in South Goa – will take around 45 minutes longer to get to from Mopa (though journey time is still only 01:30)
- The far South resorts in Canacona will be around an hour's additional drive time
- Plans for an improved North-South highway will help reduce travel times from Mopa to the far South

Indicative travel times between key resorts and Goa Mopa/Goa Dabolim airports
(source: google maps)

Taluka	Indicative resort	% of Visitors to Goa (2011)	GOI journey time	Goa Mopa journey time
North Goa:				
Pernem	Morjim	2%	01:30	00:30
Bardez	Candolim	28%	01:00	00:45
Tiswadi	Panjim	30%	00:45	00:45
South Goa:				
Mormugao	Vasco de Gama	3%	00:15	01:15
Salcette	Benaulim	35%	00:45	01:30
Canacona	Palolem	1%	01:40	02:30

Source: ICF Traffic Report

Additionally, there are no airports competing with either the proposed airport or Dabolim as highlighted below:

- Currently there are no international airports within 500km of Panjim, Goa (Mumbai, Bengaluru and Hyderabad are all approximately 600km from Goa)

- Mangalore and Pune are closer, but still over 400km away and these are domestic only airports

However, a new airport in Sindhudurg is currently being constructed. That said, the proposed new international airport is in the district of Sindhudurg in Southern Maharastra, and is about 60km from the proposed Mopa site (approximately 1hr 30 drive time). The new airport is being constructed as part of a plan to boost tourism in the area. This could potentially provide competition for accessing North Goa resorts, as well as competition for tourists in general if Sindhudurg becomes a popular tourist resort in its own right.

However, the long transfer times will mean that the Goan airports are likely to continue to be a preferred option. Journey times from Sindhudurg to the Bardez resorts for example will be over 2 hours. Increased tourism to South Maharastra could actually benefit the proposed airport in Mopa which would be well positioned to provide access to resorts in the far South of Maharashtra.

Additionally, The State of Goa are planning a number of road and highway improvements aimed at reducing congestion and improving connectivity within the state. Some of the main developments surround improving access to Panjim, but also improving connectivity through by-passing town centres and widening lanes on trunk routes.

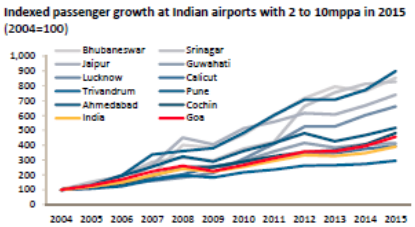
1.5.1 Latent demand estimation

Most airlines and stakeholders consulted by ICF suggested that the operating restrictions at Goa Dabolim were artificially holding back the potential size of their operations at the airport. The Indian carriers suggested that they would increase operations by around 25-30% in the absence of these restrictions.

This raises the question of a potential latent demand that is not being accommodated, which could lead to an under-estimation of the demand to Goa. In order to estimate the size of this latent demand, ICF analysed historical growth at Goa in the context of other Indian airports to see

whether the growth has been curtailed due to its restrictions.

Goa has seen considerable growth over the past decade – 15% since 2004 and 11% since 2010. This level of growth is higher than India as a whole, and better than most of India's tier I cities. However, when viewed against airports of a similar size (see figure below) Dabolim to airports of between 2 and 6mppa), Dabolim's growth is put into a more sobering context. Since 2004 its growth of 15% is actually one of the lowest in the benchmark pool.



Source: ICF Traffic Report based on info from Airportcharges.com and Skyscanner.com with prices pulled in March 2016

Strangely, this is less true in the more recent period – Goa's growth rate of 11% in the past 5 years is actually one of the higher growth rates. This is not consistent with a story of an airport being constrained. A major cause for this might be that tourist arrivals to Goa have under-performed relative to other destinations in India – connectivity could well be a cause and the reason for this has been explained earlier.

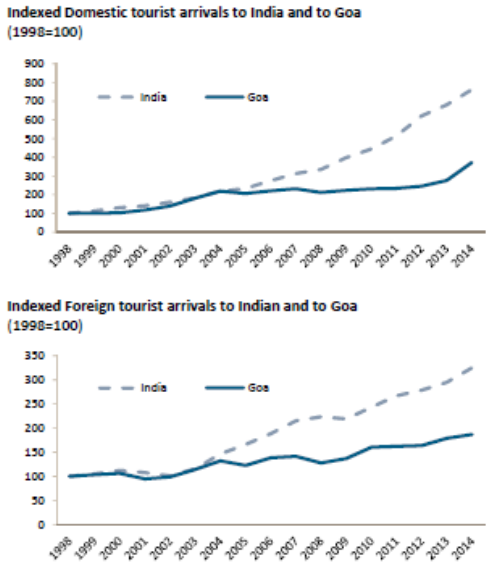
While Goa has not grown as quickly as some of its peers, it has managed very considerable growth in the past 5 years despite its limitations. Given the airport passengers are only a share of total trips to/from Goa, ICF have analysed the historical trend of inbound visitors to Goa relative to that of India as a whole to ascertain whether there has been a negative impact on tourism as a result of constraints at Dabolim Airport.

Here, we see a different story. Tourist arrivals to Goa have vastly underperformed relative to the rest of the country. This is true of both domestic (Goa has grown 5% since 2004, compared to 13% for India) and foreign visitors (Goa has grown 4% since 2004, compared to 8% for India). There could be a number of factors associated with this –

competition from other similar destinations, congestion at the resort, brand awareness, as well connectivity (air and other means).

The relatively limited international market from which Goa can draw on, compared to somewhere like Delhi whose international air service network is supported by numerous market segments, is no doubt a significant factor in the under-performance of the international market.

For domestic, the reasons are less clear. During the period 2004 to 2012, domestic air passengers grew threefold while domestic visitors barely grew at all. It is likely that this was a period in which air travel grew its share – the focus of air service growth has been Mumbai, for which rail travel is a competing mode of transport (served between 4 and 5 times per day by rail). For passengers travelling from further afield, the relatively poor service levels from Goa may mean that these markets have yet to take off. In this instance availability of slots may well be holding back the domestic market.



Source: ICF Traffic Report based on data from AAI

There is reasonable evidence to suggest that air connectivity could be constraining inbound visitors to Goa. The lack of flights at convenient times may be deterring visitors to Goa, and the operating complexities

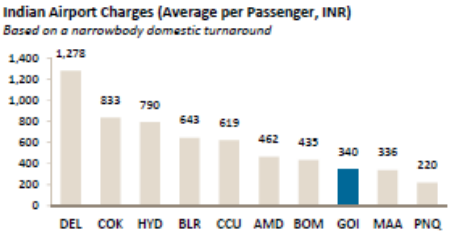
may be preventing airlines opening new routes and thus exposing Goa to new markets.

This was further supported by interviews with airlines who suggested that in the absence of operating restrictions would increase capacity at Goa by 25-30%. Given the bunching in the hours after the closure period, there is some uncertainty as to whether this would be genuinely incremental – presumably some capacity would be re-distributed.

Given the competitive nature of the tourism market, from a modelling perspective it would be inappropriate to grow this latent demand segment prior to the opening of the new airport in Mopa.

ICF's view is that when the new airport is open – and air service can fulfil its full potential - the result will be a growth in the unconstrained demand as more markets are opened up, as well as an increase in the share of passengers from nearby destinations (e.g. Mumbai) choosing air travel over the alternatives.

Goa's airport charges are one of the lowest of the top 10 Indian airports at just 340 INR per passenger as shown below.



Source: ICF Traffic Report based on info from AAI and AERA. New Delhi charges reflect 2013 charges as 2016 charges are yet to be implemented

Given the investment required in building a greenfield airport, and the system of cost-recovery in India, it is likely that Goa Mopa will carry a price premium in its aeronautical charges. When interviewed by ICF all carriers commented that airport charges would be a significant factor in their decision of where to deploy capacity, suggesting that in such a competitive market even a slight increase in charges could be unsustainable.

In reality, a 15-20% increase in Goa's charges would relate to an increase of less than 70 INR per passenger. This represents a price increase of 2% of a 3,000 INR ticket, and a far lower proportion in the context of the price of a holiday.

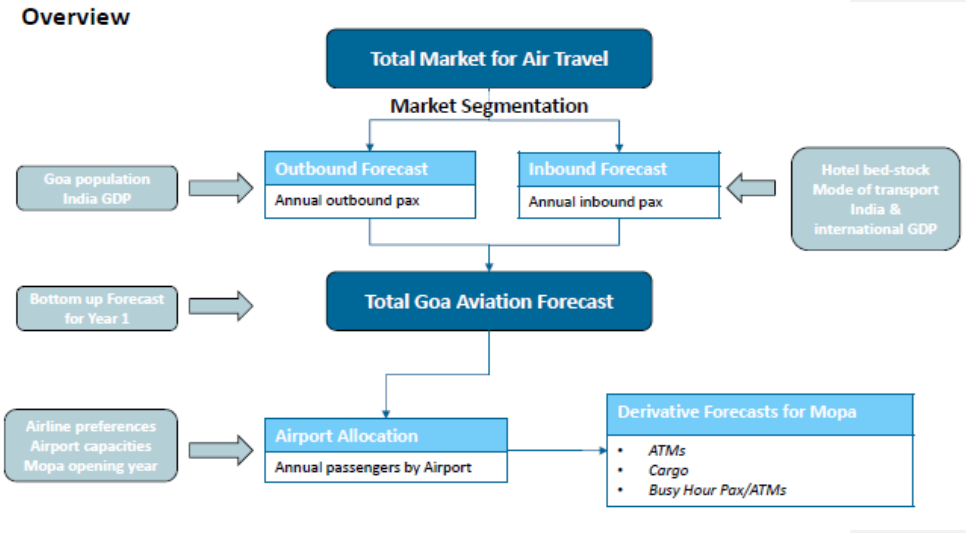
While there is no doubt that Goa is competitive, there is still considerable variation in the prices offered by airlines. This demonstrates that the market will bear differential pricing, and factors such as timing, airline loyalty, product, baggage policy will mean that passengers do not always select the cheapest option.

Furthermore, from an airline perspective, the prospect of lower delays, superior timings, and better connecting opportunities could easily compensate for a relatively minor increase in an already small element of their cost base (airport charges are typically 4-7% of the total costs).

In summary, although Dabolim holds a slight locational geographic advantage over the proposed airport in Mopa, it is significantly restricted operationally and that a serious market exists for the proposed airport in Mopa.

1.6 Forecast Methodology

The forecast methodology employed by ICF is outlined in the graphic below:



The forecast was done in two ways to calibrate findings and check results – Bottom-up and Top-Down.

1.6.1 Bottom-up Forecast

The Bottom-up Forecast was developed as follows:

- To construct ICF's bottom up forecast for the FY2016 AAI data was reviewed for the period April 2015 – January 2016, which represents 10 of the 12 months for the FY
- GMR being a leading international airport operator has taken membership for ACI which allows access to schedules of all airports in the world. The airline schedule was downloaded and correlated very well with the traffic data published by AAI. Short term projections from this data were based on consultations with airlines, tour operators, travel agents. This historical analysis was then correlated with the GDP data, through a GDP regression, to forecast the future traffic.

- International volumes remained relatively constant with the previous year. January showed a strong improvement Y/Y but the start of the charter season performed less well
- ICF has assumed that February and March outperform the previous year and that year end growth will be 2.4%
- Domestic volumes have seen strong growth and followed a similar trajectory as FY15
- ICF has assumed that Feb-Mar will continue the strong performance seen throughout FY16 but will not perform as strong as in the preceding months. ICF forecasts that year end growth will be 20%
- Schedule analysis for Feb-Mar also imply strong growth with IndiGo and AirAsia India providing extra capacity on the domestic market while the recent additions of Oman Air and AirAsia will benefit the international market
- The outlook for 2017 is also highly positive, IndiGo start receiving their new A320s in March 2016 which will see extra capacity adding across FY17, Spicejet is also set to grow its fleet and is looking to expand its network away from Delhi and Mumbai which may benefit smaller airports such as Goa
- Additionally, Visa data suggests the Tourism department has had some success in attracting French and German visitors in the past couple of years and growth in these markets looks set to continue

1.6.2 Market Segmentation

To forecast the potential volume of air travel users requires an understanding of the drivers that influence future growth levels. To do this first requires the market to be segmented into groups that have similar characteristics and drivers.

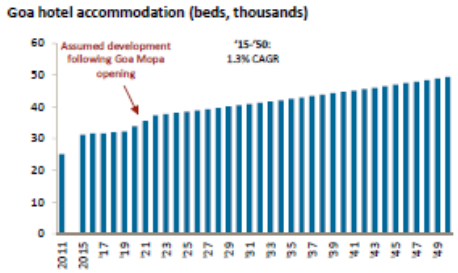
- The market was segmented into :
- Inbound arrivals
- Outbound travellers
- The inbound arrivals was further segmented into the source countries:
- UK
- Russian

- Europe
- Middle East
- Other
- Outbound travellers were further segmented into
- Domestic
- International

1.6.3 Inbound Visitor Forecast

Inbound visitor statistics were readily available courtesy of the Goa Department of Tourism. With hotel utilisation already hitting 70% year-round, future growth will become increasingly dependent on bed-stock. As such ICF limited the growth in inbound tourists by a projection of hotel room capacity.

ICF have assumed that, over the course of the next 35 years, hotel capacity is able to grow by ~ 50%. This is anticipated to come about through a combination of higher density hotels, development of under-utilised coastline (primarily in the far North of the state) and development of hinterland accommodation.



Source: ICF Traffic Report based on data from Global Insight and Department of Tourism

ICF have assumed that over the forecast period the average year-round utilisation will grow from 70% today to 80%. Currently a significant proportion of domestic visitors travel to Goa
by road and rail. As air service increases over time, ICF anticipates the proportion of inbound travellers using air travel to increase – as a result the number of inbound air travellers will increase at a higher rate than that of inbound visitors (by all modes).

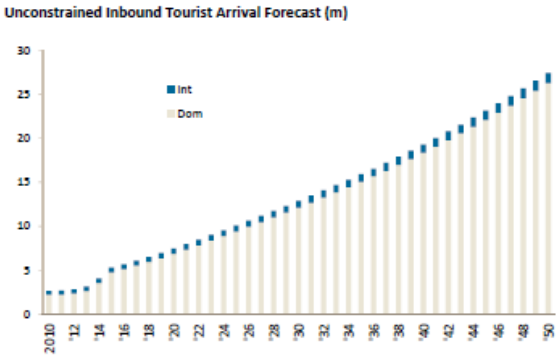
For International inbound visitors, and within the envelope of the constrained inbound visitor forecast, ICF have forecast the various source countries according to their GDP growth.

1.6.4 Unconstrained Tourism Forecasts

To demonstrate the abundant demand for tourism, and justify the supply-led approach to
forecasting inbound visitors, ICF conducted a theoretical unconstrained forecast for inbound arrivals.

ICF linked the domestic inbound arrivals to Indian GDP and linked the international arrivals to their relevant country's GDP. ICF's regression modelling of the domestic arrivals showed an elasticity of 1.0 for tourist growth to Indian GDP (the R2 statistic was 92%). Applying this elasticity to the rapidly growing Indian GDP results in massive growth in domestic visitors – growing from around 5m to over 20m in 35 years.

Clearly these levels could not possibly be accommodated in Goa, but serve to demonstrate the positive demand drivers.



Source: ICF Traffic Report

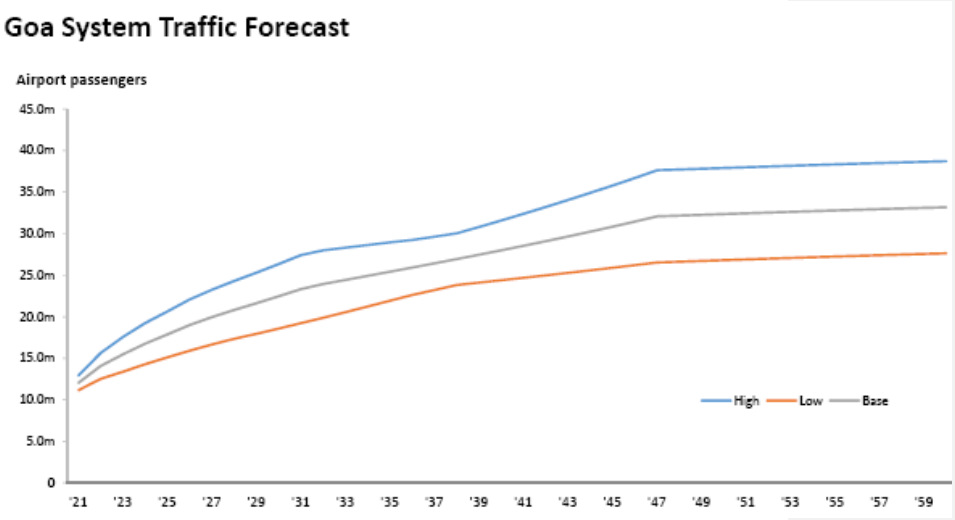
1.6.5 Outbound Trip Forecast

The following key assumptions were made by ICF to determine the outbound trips.

- Outbound trips were not available from the Dept of Tourism, nor from our independent data subscriptions. We have estimated the outbound market size using the following assumptions:
- 10% of domestic airport passengers are outbound (this is typical of primarily inbound markets)
- All charter passengers are inbound (this is pre-requisite for charter flights, which can only be sold from the home Point of Sale)
- 40% of international scheduled passengers are outbound (this is reflective of the more balanced nature of Middle Eastern markets, which will include Goans travelling to the Middle East for work and to visit friends and relatives)
- Outbound trips taken by Goan residents are assumed to grow in line with Indian GDP projections

1.6.6 Airport Allocation between Dabolim and Mopa

The following key assumptions were made by ICF to determine allocation of traffic between Dabolim Airport and the Proposed Airport at Mopa.



Source: ICF Traffic Report

From ICF's Goa Market forecast, they allocated traffic to the various airlines that currently operate at Goa Dabolim as follows.

- Based on the feedback from the interviews and ICF's judgement of the airports, they have selected airlines for switching to Mopa and the year in which they switch. The

guiding principles for the set of airline assumptions shown in the table below are:

- Goa Dabolim will remain open, and its preferable location and low costs – combined with airline inertia - will mean it retains a considerable share of its traffic base despite the complexities caused by the restricted operating hours
- Goa Dabolim will begin to cap out at around 8m, and we do not allow the airport to breach 8.5mppa. We are not assuming any changes to the operating hour restrictions in place at Dabolim
- Only Jet Airways will operate split operations. All other airlines will operate to just one of the two airports
- Airlines will not all move at once, some will wait and see how the market develops following the airport's initial opening

Airline / Category	Likelihood of Move	Sensitivity to Airport Charges
Air India	Low (noted a preference for serving South Goa resorts)	Medium
Go Air	High (relatively small operations)	High
IndiGo	Medium (large size)	High
Jet Airways	High – split operations an option	Medium
SpiceJet	High (relatively small operations)	High
Vistara	Medium (premium passengers may prefer South Goa resorts and/or proximity to Panjim)	Medium
AirAsia India	High (relatively small operations)	High
European Charters	Low for incumbent operators (prefer central location)	Low
Russian Charters	Medium (predominantly North Goa market)	Low
Foreign Schedule Carriers	Medium (central location preferable for outbound market, labour flows less sensitive to time)	Medium

Source: ICF Traffic Report

1.6.7 Derivative Forecasts

The following assumptions were made with reference to the derivative forecasts for the Airport at Mopa.

- ATMs have been forecast using 'Pax per ATM' assumptions established from analysis into the existing GOI data and derived from the passenger forecasts

- ICF has assumed Mopa's P/ATM will increase over time with the domestic market eventually reaching 150 Pax/ATM while the international market will reach a Pax / ATM of 220, as the market will continue to be served by widebodies which dramatically increases the Pax / ATM
- ICF has assumed that the domestic market split between Cat C0 and C1 will continue with the market split being maintained by the addition of turboprops/regional jets from the likes Air Costa, TruJet and Pegasus while the larger domestic airlines continue to grow the C1 market which will maintain an split similar to today
- The international market is presently ~90% Cat E aircraft which is likely to change over time as narrowbody flying to the Gulf continues to increase resulting in a larger proportion of Cat C1 aircraft serving the international markets
- Cargo volumes have been forecast using 'Tonnes per ATM' and derived from the ATM forecast
- ICF has assumed that Mopa's Tonnes/ATM will be comparable to present day GOI but will see an increase in freight carried as the increased output in Goa causes more air freight demand
- ICF has assumed that all cargo will be transported in bellyholds and that no dedicated freighters enter the Goa market
- ICF has assumed only schedule services will carry cargo as charter flights typically lack the

availability to upload additional cargo

1.6.8 Busy-Hour Forecasts

The busy-hour forecasts for the Airport at Mopa were defined as follows:

Step 1: Define busy hour passengers and ATMs

1. For passengers, the 30th busy hour metric was selected
2. For ATMs, the peak hour ATMs metric selected

Step 2: Estimate GOI base line

1. Actual hourly or daily statistics were not available for Goa Dabolim, so these were estimated using schedules data
2. This data provides a reference point for our Goa Mopa forecasts

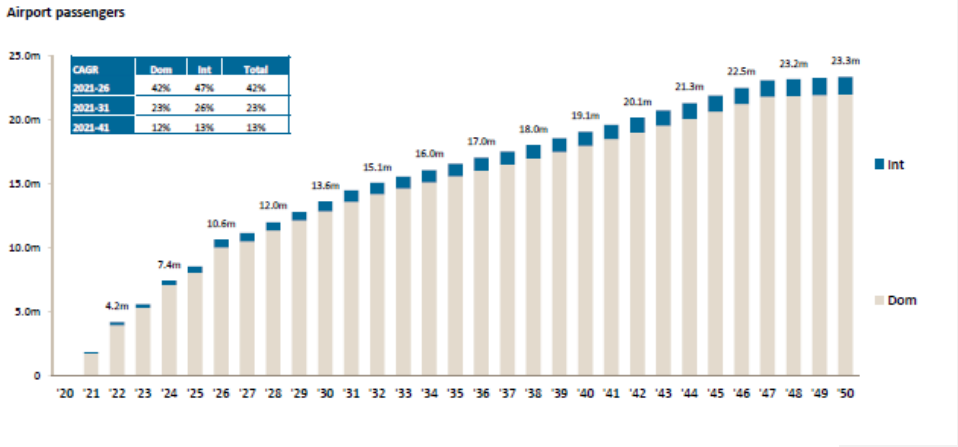
Step 3: Forecast busy hour metrics

1. As airports grow their daily and monthly profiles will change as well. Drawing from a database of numerous airports across the globe we established a relationship between annual passengers/ATMs and busy hour passenger/ATMs
2. Our global database was supplemented with information collected from the major Indian airports using (mostly) detailed schedule information
3. This was used to forecast the ratio of busy hour to annual, and consequently the busy hour metrics in future years

1.7 Forecast Results

1.7.1 Passenger Forecast

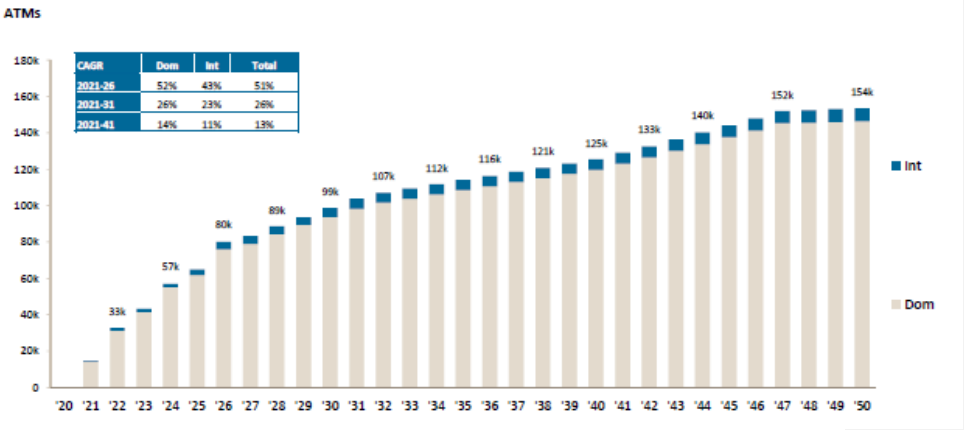
Based on ICF's analysis, the Airport in Mopa is forecast to handle 6 mppa by 2024 and 23 mppa by 2050.



Source: ICF Traffic Report

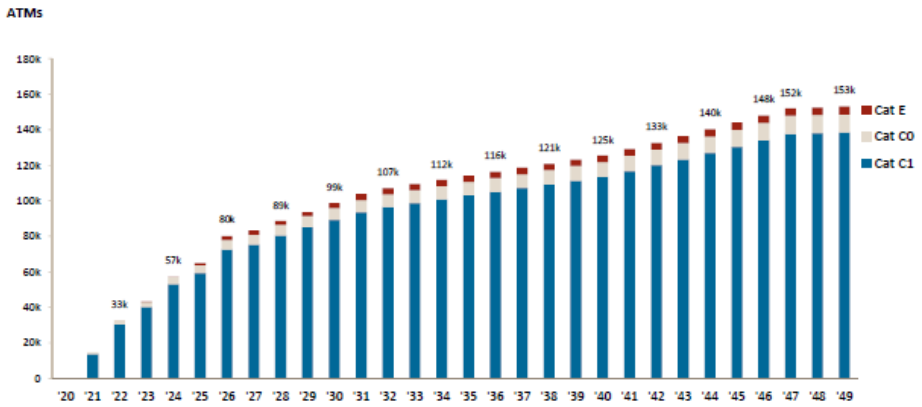
1.7.2 ATM Forecast

Based on ICF's analysis, the Airport in Mopa is forecast to grow from approximately 12,000 annual ATMs to 150,000 by 2050.



Source: ICF Traffic Report

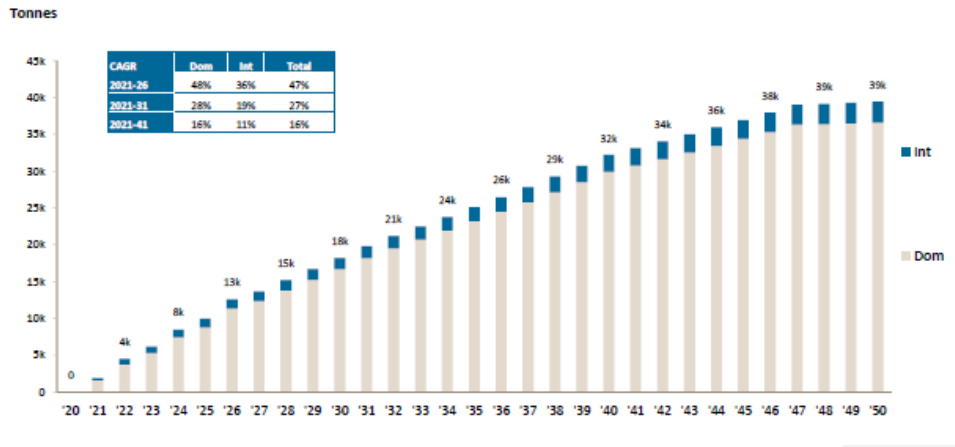
Within this mix of ATMs, narrowbody aircraft (up to Code C) will be the largest aircraft type at the Airport in Mopa.



Source: ICF Traffic Report

1.7.3 Air Cargo Forecast

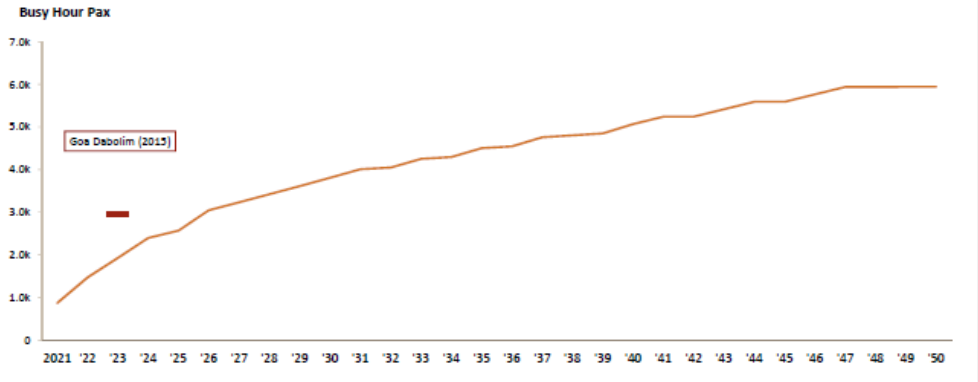
Based on ICF's analysis, Mopa will be served by bellyhold capacity with domestic volumes contributing mostly to overall throughput of approximately 40,000 metric tonnes by 2050.



Source: ICF Traffic Report

1.7.4 Busy-Hour Passenger Forecast

Based on ICF's analysis, busy-hour passengers will reach approximately 6,000 peak-hour passengers by 2050, almost twice the current rate at Dabolim Airport.

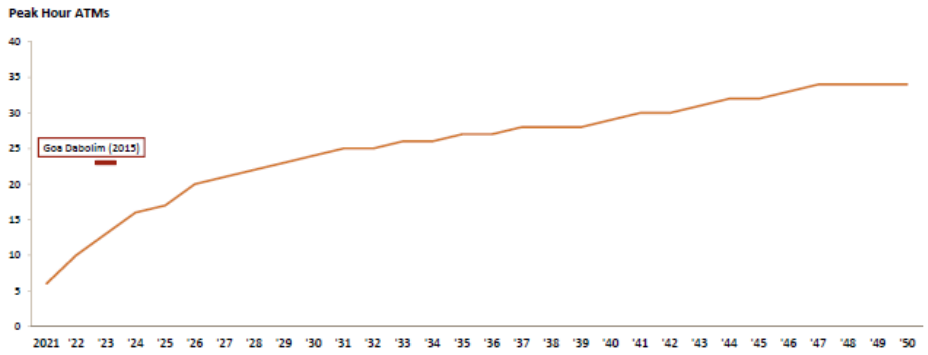


Source: ICF Traffic Report

1.7.5 Busy-Hour ATM Forecast

Based on ICF's analysis, busy-hour / peak-hour ATMs will initially not be as constrained at Mopa as there will be significantly greater potential to

spread the demand through the day and ensure airlines get more preferable slots.



Source: ICF Traffic Report

End of Volume

Annexure A

FORECAST METHODOLOGY

Forecast Methodology (3)

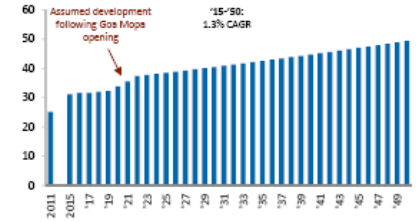
Inbound visitor forecast

Key Assumptions

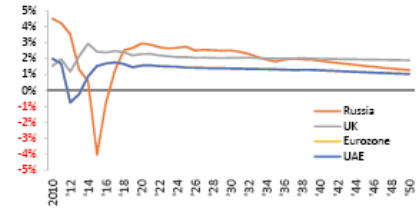
- Inbound visitor statistics were readily available courtesy of the Goa Department of Tourism
- With hotel utilisation already hitting 70% year-round, future growth will become increasingly dependent on bed-stock. As such we have limited the growth in inbound tourists by a projection of hotel room capacity
- We have assumed that, over the course of the next 35 years, hotel capacity is able to grow by c. 50%. This is anticipated to come about through a combination of higher density hotels, development of under-utilised coastline (primarily in the far North of the state) and development of hinterland accommodation
- We have assumed that over the forecast period the average year-round utilisation will grow from 70% today to 80%
- Currently a significant proportion of domestic visitors travel to Goa by road and rail. As air service increases over time, we anticipate the proportion of inbound travellers using air travel to increase – as a result the number of inbound air travellers will increase at a higher rate than that of inbound visitors (by all modes)
- For International inbound visitors, and within the envelope of our constrained inbound visitor forecast, we have forecast the various source countries according to their GDP growth

Source: Global Insight, Department of Tourism, ICF Analysis

Goa hotel accommodation (beds, thousands)



International GDP forecasts (Real GDP growth rate, %)



Hospitality Market Assessment

ARR and Occupancy Trends

- The adjoining graphs highlight the Average Room Rates and Occupancy trends in the hospitality market of Goa (prominent hotels amounting to approx. 5,300 room keys)
- Goa hotel market exhibited approximately 2.3% increase in occupancy and 3.5% increase in average rate in 2014-15 over 2013-14, maintaining the uptrend in market wide RevPAR performance for the fifth year in a row.
- While the overall demand and supply dynamics remained in line with historical trends, what was noticeable was the change in nature of demand and its segmentation
    - Increase in demand from domestic urban tourists coupled with events as compared to foreign tourists
- While the growth in foreign tourists has been muted since the past few years, strong rebound of the domestic economy has more than compensated for the shortfall, so as to shift the attention of hotel operators across Goa towards the domestic market

GMR | Cushman & Wakefield

Source: C&W Research, Tourism Board of Goa