Aug 01, 2004

DAVID DAPICE
NGUYEN XUAN THANH

LONG THANH OR TAN SON NHAT AIRPORT: BUILD NEW OR EXPAND?

Vietnam is planning to start building a new 5000-hectare airport in Long Thanh, Dong Nai to replace the international operations of Tan Son Nhat (TSN) airport in HCMC. The existing airport would continue to take domestic flights after the new airport begins to operate in 2015. Long Thanh airport, 50 km northeast of downtown HCMC, would be able to handle 25 million international passengers a year and cost $3-4 billion in its first phase. When completed, the new airport would serve 80-100 million passengers a year and cost $8 billion. This case responds to a request from the government to review the advisability of the current timetable and plan.

General Facts about Airports and Air Travel - International Passengers

Most airports serve passengers that are coming from or going to the city served. These "final destination" airports generally serve some mix of business and tourist/family passengers. The demand reflects the population, income and economic/tourist opportunities for each group in the area served by the airport. It is also important to distinguish between domestic and international passenger traffic, as these often have somewhat different rates of growth. In addition, some cities are served by two or even three airports while others have only one. When there are multiple airports, one is often a major hub. . All of these considerations are important in determining the demand for a particular airport. In terms of international passengers (both arriving and departing), in 2008 the following top Asian airports had traffic as indicated:

Top Asian Airports in 2008
International Arrivals and Departures

	(In millions of passengers)	(*Annual Growth over 2005)*
Hong Kong	47.2	6.0%
Singapore	36.3	5.9%
Bangkok	31.6	5.6%
Inchon-South Korea	28.6	3.9%
Narita, Tokyo	31.4	5.0%
Taiwan Taoyuan	19.2	0.0%
Shanghai-Pudong	17.5	6.5%
Kuala Lumpur	17.7	5.7%*
(Tan Son Nhat)	(4.0)	-1.6%

* Growth rate is for total passengers, not only international. Data are from Airports Council International and from the 2008 Ho Chi Minh City Statistical Yearbook

This case was written by David Dapice, economist at the Vietnam Program, Harvard Kennedy School and Nguyen Xuan Thanh, lecturer of Public Policy at the Fulbright Economics Teaching Program. Fulbright Economics Teaching Program's cases are intended to serve as the basis for class discussion, and not to make policy recommendations.

Copyright © 2004 Fulbright Economics Teaching Program

Most of the world's top airports are also major regional hubs. Hubs are airports in which many passengers transfer to a different flight, but do not have the city served as a final destination. Many countries decide to try to become hubs, but only a few succeed. By their very nature, hubs are most efficient when there are only a few in one region. Southeast Asia already has Hong Kong, Singapore and Thailand (which has built a new airport as large as the proposed Dong Nai airport) that serve as regional hubs. Malaysia built a large airport far from their capital city and intended it to be a hub. It charged very little for aircraft using it but it has failed to become a hub, in spite of annual operating subsidies of over $250 million a year.

Why is it so hard to become a hub once there are already established hubs? Think about the problem from the point of view of an individual airline company. There is a "network efficiency" in having dozens of different airlines use the same airport because the passenger can make many more connections. So long as congestion is under control (and congestion is not a problem in Southeast Asian hubs, especially with the new Bangkok and Hong Kong airports and the expansions at Changi - Singapore), each airline company gets value from having many others also come to the same place.[1] Even with very low airport use costs at a new airport, unless many other airlines also make the move, the network efficiency is lost. Why go to an airport that is not a final destination if there are few connections? This is what doomed the Malaysian effort and it could threaten the Dong Nai airport. The only chance is if, like Thailand, there are eventually enough tourists so that many airlines serve Dong Nai (or TSN) as a final destination, and then a hub might develop. However, new technologies threaten even this scenario.

Very large "hub" airliners such as the A-380 and the Boeing 747 are selling very poorly in recent years while "point to point" airliners such as the Boeing 777/787 and Airbus 330/350 are selling much better.[2] New designs allow almost equal efficiency (cost per passenger-kilometer) in long-range smaller airplanes and higher frequencies are often desirable. As air traffic increases, it becomes easier to connect many city pairs directly rather than having to go through a hub, with the complications of time and expense. Thus, the future role of hubs in general is not certain. Traffic (flights) at most hubs has not grown rapidly in recent years.[3]

Tan Son Nhat and/or Long Thanh Airport International Arrivals

Tan Son Nhat has a low current international demand (4.0 million in 2008; 2009 may be down 10% or so), only a sixth of even the Phase I projected capacity of the Long Thanh airport. However, its international traffic has been growing at 9% a year from 2000 to 2009. TSN added 1.3 million international passengers in the last nine years. It would not be surprising if international traffic continued to grow at 6% a year, rising to 7 million by 2020. After that, passenger growth is difficult to project. Air traffic for all of Southeast Asia is projected to grow at 6-7% a year over the next two decades and normally rapid rates of growth decline once the base becomes larger.[4]

Tan Son Nhat (TSN) is not currently a hub, except perhaps for Cambodia. There are about 100 international flights (~50 arrivals and departures each) a day. The rationale for the new airport in

[1] Hong Kong's airport has 750 flights per day and is serviced by 80 international airlines.
[2] From 2005 to 2009, for large hub jets Boeing has delivered only two passenger 747's and Airbus has delivered 16 A380's. Post-2004 orders for both have been 98, most meant to replace retiring large jets. Mid-size jets had over 700 deliveries and over 2500 orders, and these tend to fly around hubs.
[3] A few Middle Eastern airlines have ordered a very large number of A-380 and other airplanes and are gambling that they can become global hubs. (For example, a person flying from Europe or New York to Singapore wouldn't fly direct but through Qatar.) It remains to be seen if this strategy works, but if it does succeed it has negative implications for other hubs.
[4] See Current Market Outlook, 2009-2028 at www.boeing.com

Dong Nai includes the argument that by building another large airport in Southeast Asia, HCMC would become a hub.

Domestic Passengers

In terms of domestic passengers, aside from international tourists using domestic air services, economic growth within the country is usually the most important determinant of demand. Air traffic within a country normally grows a bit faster than its real income. The size of the country and the quality of roads and trains will also influence the decisions of travelers, who may decide to use non-air transport if the cost and time involved are competitive. Of course, the domestic passengers using any specific airport will also depend on the number of airports serving the area and the distance from the central city.

Tan Son Nhat had 1.52 million domestic passengers in 2000 and about 4.3 million in 2009, a 12% annual growth rate. This rapid growth in part reflects both rapid tourist growth, recovery from the Asian Crisis and a partial deregulation of domestic air travel. This second and third impacts will not remain as powerful going forward. Growth of 10% a year would not be surprising if the economy continued to grow at 7-8% a year. If the road (bus) and train systems improve further, this might also compete with air travel for some destinations. Domestic passenger demand of 12-14 million in 2020 is quite possible if overall GDP growth remains high. Growth rates beyond 2020 are quite difficult to predict, but are likely to follow regional trends more closely. If real GDP and income growth slowed, it is likely that demand for domestic air services would too.

Tan Son Nhat Total Demand and Potential Capacity

Putting both domestic and international demand together, the 2009 TSN passenger flow of 7.8 million might rise to as much as 22 million by 2020. The old terminal can handle only 7 million passengers a year. A new terminal, which took three years to build, was completed in 2007 and cost $220 million. It can handle 10 million passengers a year. Thus, the capacity of TSN by 2009 was 17 million. The new terminal can be expanded to handle 15 million passengers at an additional cost of $100 million, bringing total airport capacity to 22 milllion. The total area of TSN airport is 1,800 hectares[5], of which 1,000 hectares belongs to the Vietnamese military leaving only 800 hectares for civilian use.

However, even on the 800 hectares, there is room to add another new terminal that could ultimately increase TSN capacity to 37 million for an extra cost of less than $350 million. Changi airport in Singapore, which has 1300 hectares, in 2008 handled over 36 million passengers and has a capacity for over 68 million with the opening of its third terminal and a budget terminal.[6] There is no doubt that handling half as many passengers as Changi's capacity in three-fifths of Changi's physical area is possible. If the plans for a golf course and luxury housing on airport land now managed by the military were modified, the potential capacity of TSN would be even higher.

The number of takeoffs and landings at TSN in 2007 were 58 thousand. Changi in Singapore, with two similar length runways, handles over 200 thousand takeoffs and landings a year. Even if the number of flights were to triple, it appears that TSN could handle the air traffic - assuming it could operate in a manner similar to Singapore, and invested in the terminal facilities to handle the aircraft.

[5] The Tan Son Nhat airport area used to be 2,400 hectares. However, due to the distribution of land for housing development, its effective area, according to one recent survey, is now 1,800 hectares, of which 1000 hectares belong to the Vietnamese military. This military area is excluded from the effective area available for civilian use. If the military were to move to Bien Hoa (a nearby airbase), with some compensation, the area available for civilian use would increase by 125%.

[6] The investment cost of expanding Changi to 67 million was $880 million for the two terminals.

Noise and Safety

One argument used for the Dong Nai airport is that the noise and safety issues around TSN make it unsuitable for greatly increased use. Over the long run, this might be true. However, other airports have employed certain mitigation measures.

1. Newer airplanes are much quieter than older or even existing airplanes. As old airplanes are phased out (they are not fuel efficient and the current high fuel prices tend to increase their rate of retirement), the typical plane using TSN will generate much less noise and pollution than those used now or in the recent past. Indeed, TSN could require that airlines use newer and quieter airplanes, as many other airports do.

2. Other airports with dense development around them have found other ways to mitigate the impact of the airport. These methods include sound proofing buildings at the expense of the airport, buying residential homes in critical flight paths and converting them to warehouses or other industrial uses, and restricting late night airport use.

3. Finally, there is no plan to close TSN, which will remain open for domestic traffic. Domestic traffic will continue to grow. It is unclear if most of the arguments against international use of TSN in the future are nearly so strong if a large number of domestic passengers and flights continue to use the existing (if improved) airport.

Traffic and Congestion Issues

While TSN is very close to downtown HCMC and is scheduled to get a subway connection by 2012, the Dong Nai airport will require a 50 km trip into the city center over roads that are not yet built. This will itself increase pollution and congestion, generating more traffic than TSN would for an equal number of passengers. Domestic connections from international flights or international connections from domestic flights would be much more difficult with two airports far from each other. Traffic, pollution and time wasted would increase.

Planning New Airport Investments

There may be different interests at work in determining whether or not to make a public investment in infrastructure. Indeed, when public money is being invested (or private money with an effective public guarantee or other subsidy), we often observe the "principal-agent problem". This simply means that the public cannot itself do many things directly so they must entrust "agents" to act on their behalf. In the case of airports in the southern part of Vietnam, it is the Southern Airport Authority that is the agent, under the direction and control of the government. The incentives for an agent are not always aligned with the interests of the principal. The agents may have many reasons to invest more quickly or lavishly than would a principal using his or her own money.[7] In such cases, unless there are careful review mechanisms in place, there is unlikely to be the best use of public funds.

One way to resolve this dilemma is to put a new airport on the Dong Nai land up for private development. There would only be two stipulations. One is that the charge for use could not exceed

[7] There can be many reasons for the divergence. An agent may fear more criticism if there is a shortage than a surplus (think electricity blackouts). An agent may get emotional satisfaction from building something big, even if it is too big. An agent may get benefits from being associated with a particular investment. Foreign "inspection" trips and use of project cars are some examples. In extreme cases, an agent may be bribed and benefit directly from payments by contractors. The point is that the public's money is being spent, not the money of the agent.

certain levels associated with similar airport charges in Southeast Asia. The second is that no airplane would be required to use the airport. TSN would remain open for business and free to upgrade with new terminals. Under these conditions, would a private firm start now for a 2015 opening? Or, would the developer argue that a delay in construction was desirable until TSN reached some level closer to its capacity?

Freight flights might prefer the Dong Nai airport, as closeness to HCMC would be much less of a factor, and the many factories in Dong Nai might prefer a closer airport. Hub passengers would prefer the Dong Nai airport if their connecting flight were also taking off from there. In general, they would prefer not to have to switch airports

A private investor would calculate how many passengers or airplanes would demand and be willing to pay for a new airport and compare that revenue to the costs of servicing the debt of a new airport and any profit expected. If 10% were the cost of capital, then initially $300 to $400 million a year would be needed to cover interest and profit, and additional amounts would be needed to pay down the debt.

A practice being used in some projects in Vietnam is to have a state-owned enterprise be the "private" developer. The state enterprise often has access to cheap loans and grants of land. In this situation, the developer may not pay very close attention to commercial considerations, since their profit is assured through the various subsidies.

Airport Taxes and Landing Fees

TSN currently charges $16 per departing international passenger. The Airport Authority also receives income from stores that rent space in the airport, parking fees and from landing and other service fees to aircraft. The income from these pays for labor and materials and services used in operating the airport. At a well-run international airport like Changi, each passenger generated about $22 in gross revenues and $6 in gross profit (before interest, depreciation and taxes) to repay debt. A Vietnamese airport would do well to equal this income per passenger. Kuala Lumpur generated a net operating loss and other airports do well to generate half as much net revenue per passenger as Singapore.

Options

There are several possible ways to proceed. Some[8] of them are listed below:

1. Use TSN up to 37 million while reserving land for Long Thanh: This option would spend about $ 400 to $500[9] million and allow use of the existing airport well past 2020, but keep open the possibility of developing Long Thanh when demand exceeded the equivalent of one more expanded "new" terminal. If passenger growth slowed down in the next decade or after 2020, the new airport would not be needed until 2030 or later. When total demand exceeded 30 million, international demand would be 8-10 million.
2. Build Long Thanh for a 2015 opening and close TSN: If demand continues growing at recent rates, there should be 13-14 million total passengers by 2015. Transferring all of them to Long Thanh (including domestic) would allow selling TSN land to finance the construction of Long Thanh. If 800 hectares could be sold for $500 to $1000/square meter, the proceeds would be $4-8 billion. This would allow construction of a rail line into HCMC from Long Thanh, reducing time and congestion. It would also reduce the amount needed from airport charges to repay the airport construction.

[8] These three options do not exhaust all possibilities. Other options are possible and solicited, if sound.
[9] This discussion has not included freight services, but they would also be included in any expansion.

3. Follow the existing plan and build a new airport to be ready in six years. The new airport would be for international arrivals/departures only and start with 5-6 million passengers, assuming a 6% annual growth from 2009-2015. TSN airport would continue to take domestic arrivals and departures. New terminals would be needed if domestic passenger growth continued in double digits.

Criteria for Project Approval

In deciding which option to propose, you should consider the following:

1. There is real uncertainty about the future pace of growth of demand for air services. How would your decision adapt to a much higher or lower actual future pace of passenger growth?
2. Economic viability: If you can only plan on $5 operating (EBITA) income per passenger, how much could you invest safely without incurring large losses for an extended period? Relate this answer to the cost of capital.[10]
3. Environment and congestion: Evaluate the impact of your choice on the surrounding neighborhoods which the airplanes fly over and the traffic impact on the larger region as tens of millions of passengers move to and from the airport. Specify assumptions about roads and rail connections.
4. Externalities from being a hub and viability of HCMC as a hub: Having extensive air connections makes tourism, FDI and trade easier. Is it likely that investing in a new airport is an efficient use of public funds to promote these objectives? (There were 4.3 million visitors to Vietnam in 2008, of which 3.6 million came by air. Thailand has over 14 million international visitors.)
5. Interests of the agents: If you are in a state enterprise and the government asks you to invest in this airport and will provide low-cost credit and grants of land, to what extent are you likely to act like a commercial firm that is interested in the underlying profitability of the project without subsidy?

Interests of the government(s)? Why might the government wish to promote the construction of a new airport well before it might seem necessary? Consider the national, provincial and possible donor (ODA) perspectives.

[10] The government has had several failed domestic (local currency) bond auctions where they tried to finance the current effective 2009 deficit (8% of GDP) at fixed interest rates of 8-10%, but had no or few bidders. Commercial dollar borrowing in large amounts is not possible. A minimum estimate of substantial long term dollar borrowing would be 10% nominal per year. The long term outlook for dollar inflation is uncertain, but the current difference between ten year US Treasury bonds and inflation indexed bonds is 2%. Thus, the implied real rate of return in dollars would be at least 8%.

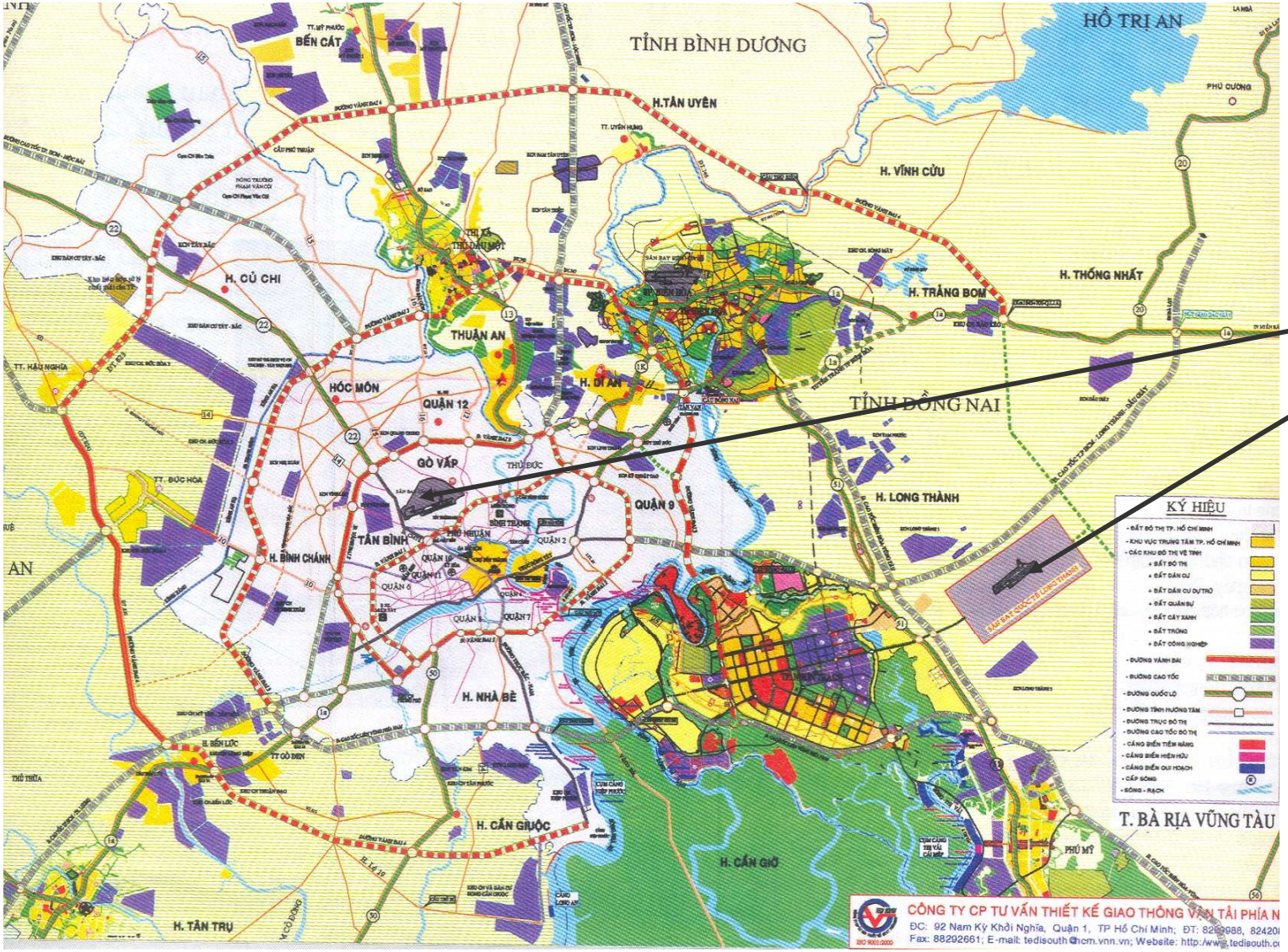


Exhibit 1: Tan Son Nhat and Long Thanh Airports in the Transport Masterplan for the Greater Ho Chi Minh Area

Source: TediSouth

Exhibit 2: Data for Tan Son Nhat Airport

Passengers [Pax] in thousands; Flights in thousands

	Domestic Pax	International Pax	Total Pax	Flights
1995	1,150	1,607	2,757	27.9
2000	1,523	2,309	3,832	32.8
2005	2,931	4,172	7,103	57.8
2009 est.	4,300	3,600	7,900	59.0

Past Annual Growth Rate (%)

	Domestic Pax	International Pax	Total Pax	Flights
1995-00	5,8	7,5	6,8	3,3
2000-09	12.2	5.1	8.4	6.7
1995-09	9.9	5.9	7.8	5.5

Pax in millions at Projected Annual Growth Rate at 10%/6%

	Domestic Pax	International Pax	Total Pax
2015	7.6	5.1	12.7
2020	12.3	6.8	19.1
2025	19.8	9.1	28.9

Pax in millions at Projected Annual Growth Rate at 12%/6%

	Domestic Pax	International Pax	Total Pax
2015	8.5	5.1	13.6
2020	15.0	6.8	21.8
2025	26.4	9.1	35.5

Source: Ho Chi Minh City Statistical Yearbook, various issues and author's estimation. The base for 2015, 2020 and 2025 estimates is the 2009 passenger estimates of 3.6 million international passengers and 4.3 million domestic.

Exhibit 3: Boeing Projections of Passenger Traffic in Southeast Asia
(The data are in billions of revenue passenger kilometers*)

	2008	**2028**	**% per Year Growth**
China to SE Asia	50.0	146	5.5%
Europe to SE Asia	109.0	327	5.7%
Middle East to SE Asia	46.0	165	6.6%
N. America to SE Asia	37.0	136	6.7%
NE Asia to SE Asia	74.0	234	5.9%
SE Asia to SE Asia	90.0	424	8.1%
SW Asia to SE Asia	22.0	101	7.9%
Total	428.0	1533	6.6%

Source: Boeing Aircraft, Current Market Outlook 2009-2028, at http://www.boeing.com/commercial/cmo/index.html

Boeing Aircraft Corporation projections of air traffic are carefully made and taken seriously since ordering aircraft must typically be done years in advance, and the aircraft themselves last many years in service. It is evident that they foresee 6-7% growth for Southeast Asia so a 10% growth projection for HCMC international traffic is well above that of the region. This is certainly possible, but may not be sustainable over very long periods. A tourist projection for Vietnam by a consulting group for 2006 to 2016 estimates 7.5% annual growth.

* A "revenue passenger kilometer" is one paying passenger traveling 1 km by aircraft.

Exhibit 4: Foreign Visits to Vietnam

A major source of demand for international and even domestic air travel is foreign visitors. According to the 2008 Statistical Yearbook, the number of foreign visitors to Vietnam rose from 2.14 million in 2000 to 4.25 million in 2008, a compound rate of increase of 9% a year. The number in 2009 is likely to be 15% to 20% below 2008. The visitors from China come mostly by land and taking them out would reduce the numbers to 1.65 million in 2000 and 3.5 million in 2009. While much higher tourist visit targets are projected, it would appear that 2000-2009 trends in foreign visits by air fit well within a projected 9% annual growth rates for all of Vietnam. As stated previously, 9% growth is well above the projected growth for all of Southeast Asia.

Exhibit 5: Airport Capacity and Total Traffic

Because the proposed Dong Nai airport is for international traffic only, that has been the focus of this case. However, total use may also be of interest. A list of the busiest airports by total passenger flow (domestic and international) is given below, with data in millions of passengers for 2008.

Atlanta-Hartsfield	90.0	Madrid	50.8
Chicago-O'Hare	69.4	Hong Kong	48.0
London-Heathrow	67.1	New York – JFK	47.8
Tokyo, Haneda	66.7	Amsterdam	47.4
Paris (CDG)	60.7	Las Vegas	44.1
Los Angeles	59.5	Houston, USA	41.7
Dallas	57.1	Phoenix, USA	39.9
Beijing	55.7	Bangkok	38.6
Frankfurt	53.5	Singapore	37.7
Denver, USA	51.4	Dubai	37.4
		San Francisco	37.4
[Tan Son Nhat, '09	8.7]		

Again, many of the non-US airports serve as major international hubs, while most of the US airports are domestic hubs.

The capacity, as opposed to current use, of airports varies depending on the terminal expansion plans. For example, Changi, Singapore has increased its capacity from 44 to 67 million passengers when the new terminal opened in 2008. The new Bangkok international airport has a capacity of 45 million to accomodate the 11-12 million tourists (which create about 24 million trips), but the 3200 hectare area is capable of scaling up to accomodate up to 100 million. Hong Kong has 45 million capacity but is building a new terminal and will increase this to 60 million. In all cases, these airports built close to existing demand but left room for expansion, rather than "overbuilding" to start with. Narita is operating near capacity (about 35 million) but is upgrading two terminals and with a new runway and will reach 50 million capacity by 2010.