

## *Annex B*

### **Airport infrastructure needs to 2030: Background to global estimates**

The project's assessments focused on current airport capital expenditures, current and future passenger and freight levels, and the relationships between them. Details are set out in the following sections.

#### **Current air passengers and future traffic projections**

Industry estimates of actual terminal passengers in 2007 and 2008, and forecasts of domestic, international and total terminal passengers (including transit) in 2017 and 2027 are set out in Table B.1.

Table B.1. **Terminal air passenger forecasts, 2007-2027 (millions)**

	Total air passengers 2007	Total air passengers 2008	Total air passengers 2017	Domestic air passengers 2027	International air passengers 2027	Total air passengers 2027	Growth air passengers (%) 2007-2027
Africa	138	146	245	135	261	401	295
Asia/Pacific	1 150	1 200	2 193	2 629	1 272	3 916	340
Europe	1 472	1 517	2 143	659	2 200	2 868	195
Latin America/ Caribbean	328	339	539	583	273	869	265
Middle East	158	167	264	67	315	387	245
North America	1 552	1 539	1 935	2 127	404	2 536	163
World	4 798	4 907	7 320	6 200	4 725	10 976	229

Note: Estimates of total air passengers include scheduled and non-scheduled flights and include transit passengers.

Source: ACI (2009), *Global Traffic Forecast 2009*, ACI, Geneva.

#### **Industry airport capital expenditure (CAPEX) estimates**

Estimates of airport capital expenditure in 2007, 2008, 2009 and 2010 were published in ACI *Airport Economics Surveys* 2008 and 2010. The ACI reports make a number of qualifications and note some important limitations to these industry estimates, including the following.

Table B.2. Airport capital expenditure (Capex) by region<sup>1</sup>

USD millions					
Region	2007	2008	2009	2010	2011
Africa/Middle East	6 000	7 500	3 000	1 800	2 200
Asia – Pacific <sup>2</sup>	8 500	11 500	5 800	6 900	6 500
Europe	14 000	17 500	12 800	12 500	11 800
Latin America/Caribbean	1 600	2 600	1 800	3 500	3 800
North America	10 000	11 800	11 200	13 800	10 800
Total	40 100	50 400	34 600	38 500	35 100

Notes: 1. ACI's estimates include **only upgrades or expansions** of **existing** airport infrastructure. 2. ACI's Asia/Pacific region 2007 and 2008 estimates excluded all CAPEX investments in China. ACI's 2010 report advises its 2009, 2010 and 2011 data include two airports in mainland China.

Source: ACI (2008), *Airport Economics Survey 2008 for 2007*, ACI, Geneva; and ACI (2010), *ACI Survey 2010 for 2009*, ACI, Geneva.

In its reports, ACI defines airport capital expenditure as follows: “CAPEX: A capitalised expense for a newly purchased capital asset or an investment that improves the useful life of an existing capital asset. New/greenfield airports are not included.”

The survey response rates for the ACI Survey 2010 varied by region. Responses in most regions accounted for airports handling over 50% of the terminal passengers in the region. For the Africa region, the responses encompassed 36% of the region's total passengers. For the Middle East, the survey response was a statistically invalid sample. For this reason, **Middle East airports are not included** in the ACI Survey Report 2010. Overall responses encompassed airports handling around 68% of global passengers.

In its 2008 Survey, ACI advised that airport investment in China was expected to rise to USD 30 billion in 2009, but that it was unclear which proportion will be invested in existing airports. For this reason, ACI excluded China's airport CAPEX in 2009 from its CAPEX estimates (shown in Table B.2). ACI's 2010 survey results included data from only two airports in China.

Globally, the ACI 2008 Report anticipated a total CAPEX in 2009 of USD 50.2 billion. ACI's 2010 Report revised the 2009 CAPEX to USD 34.6 billion. Reflecting the impacts of the recession, the revised level in 2009 and the levels expected in 2010 and 2011 are all well below previous trend levels of around USD 50 billion per annum.

Nevertheless, overall airport capital expenditures would be considerably more if all current investments in airport upgrading and expansions in China and the Middle East were included – and would be higher again if all expenditures in all countries on new airports in greenfield sites were also included. These aspects are considered in more detail in following sections.

## Relationship between air passenger movements and ACI CAPEX

The global levels of passengers and ACI's (narrow) estimates of airport capital expenditures set out in Tables B.1 and B.2 provide insights on airport infrastructure expenditure per global terminal air passenger. Trend levels during the pre-recession

period of rapid air traffic growth were around USD 10 per passenger. Post recession levels in 2009, 2010 and 2011 are closer to USD 8 per passenger.

From the limited data available, it appears that the ratio of current capital expenditure to future passenger levels is more stable. ACI data suggest that current global CAPEX forecast per passenger two to five years ahead is around USD 6.50.

Of course, all these unit costs per passenger figures exclude capital expenditures actually made but not encompassed in ACI estimates, e.g. in the Middle East, China, and on greenfield sites.

## Currently planned major airport investments

The ACI Airports Economics Survey 2010 identified an indicative list of planned major airport investments that had been signalled in different countries. This listing includes both upgrades and extensions of existing airports and possible investments in new airports on greenfield sites.

For each of the regions, Table B.3 summarises the ACI listing of major planned investments in upgrading/extensions to existing airports and in new airports in greenfield locations in the region.

Table B.3. **Planned airports investments – including major upgrades/extensions at existing airports and possible major greenfield site investments**

USD billions

	Planned major investments existing airports	Possible greenfield airports (number by region)	Indicative expenditure for greenfield sites	Total planned investments existing and greenfield A/Ps
Africa	4	5	4	8
Asia/Pacific	74	11	61 (including A/P Tokyo Bay – 35 billion).	135
Europe	79	5	12	91
Latin America	7	2	2	9
Middle East	42	6	20	62
North America	128	–	–	128
Total	335	29	100	435

Source: ACI (2010), *Airport Economics Survey 2010*, ACI, Geneva.

Some of these investments are currently under way. Many of the planned investments do not have firm starting dates. A few investments were started but postponed due to the recent financial crisis. Some will most likely be started if post-recovery trends are in line with current global projections for air passengers (i.e. a doubling of air passengers in 15 years) and air freight (i.e. a tripling of air freight within 20 years). The major expenditures involved would most likely be undertaken over a period of 10-15 years after the project begins.

It is important to note that the ACI listing of planned expenditures is not exhaustive by any means. As an example, it only lists one major planned airport development in China – which is for a new airport Kunming International, Yunan, southwest China. It does not list any expenditures on upgrades or extensions of any airports in China. As

well, there will be many smaller investments at the hundreds of other airports not included in the ACI listing of planned major projects.

### China's airport expenditures

China's GDP could increase three to four times over the next 20 years. Boeing's *World Air Cargo Forecast 2010-2011* highlighted the Chinese State Council announcement in 2008 of its National Airport Allocation Plan, which is aimed at ensuring that:

- 82% of the country's massive population lives within 100 kilometres of an airport by 2020 (up from 61% at present);
- 96% of GDP can be accessed via air services by 2020, up from just 61% at present.

To achieve this goal, the report advises another 52 new airports will be developed by 2020, following the 45 new airports to be completed by 2010 that brought the total number in China to 177. This programme would require a total investment of USD 67.1 billion through 2020, of which USD 20.9 billion had been allocated by 2010. Of the 97 totally new airports, 50 will be developed in the northern and north-western regions, including the second Beijing Airport.

Clearly, there are extraordinarily high current levels of airport expenditure in China – and expected future expenditure remains uncertain, with plans being revised as circumstances change. The safest course of action seems to be to rely on announced programmes and make revisions if necessary in the light of actual expenditure levels reported after the event. Official announcements on planned investments in new airports over the period to 2020 indicate China's greenfield airport investments could amount to around USD 7 billion per annum over the next decade.

For the period 2020-2030 and beyond, China's GDP growth rate (possibly around 4% per annum) can be expected to be lower than current levels (which are around 9% per annum). However, the lower growth rates will apply to an expanding base. As a result, air passenger and freight volumes and capacity requirements can be expected to continue to grow quickly. It seems very likely that China's annual expenditures on greenfield airports between 2020 and 2030 could be lower than over the period to 2020. However, its investments in upgrading and expansion of existing airports could be expected to increase, given that these airports will handle most of the passenger and freight growth. Overall, annual airport investments might continue at levels not so different from current levels.

### Airport investments elsewhere

Over the next 10 to 20 years many other large developing countries – including Brazil, India and the Russian Federation – will continue to grow and expand. Other countries in developing regions (e.g. in Asia, the Middle East, Africa and Latin America) can be expected to continue to grow, too.

No comprehensive listing is available of expected investments in upgrades and expansions of existing airports **and** development of greenfield airports in all these countries – but they are likely to be substantial. From 2020 to 2030 and beyond, for

example, India's likely economic growth can be expected to follow a similar path to China's, with a 20-year time lag – and can be expected to lead to rapid increases in air traffic demand and investment needs.

Taking all the above factors into account, the project's estimates of likely airport investments on greenfield sites in China and the other major developing countries combined are USD 10-20 billion per annum over the period to 2030. These amounts have been included in the forecast airport capital expenditures in Table B.2. The foregoing discussion suggests these estimates may well be quite conservative.

## *Bibliography*

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