



# Investment requirements for aircraft fleets and for airport and route facility infrastructure to the year 2010

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and published under his authority*

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# Foreword

## Purpose and scope

1. *There is broad consensus in the air transport industry that the demand for air travel will recover from the current recession and return to traditional growth rates into the next century. ICAO forecasts, which are in line with those of aircraft manufacturers and other institutions, show an increase in demand in terms of the number of passengers carried from just under 1.2 billion in 1991 to nearly 2 billion by the year 2000 and about 2.8 billion by the year 2010.*
2. *There is concern, however, about the continuing ability of airlines and providers of airports and route facilities to find the financing to meet this traffic demand and at the same time face the investment requirements of such pressing needs as overcoming congestion problems; implementing the global satellite-based communications, navigation and surveillance (CNS) and air traffic management (ATM) system; introducing airborne collision avoidance systems; meeting environment-related operating restrictions such as those imposed to counter noise and engine emissions; replacing aging aircraft; and increasing aviation security. The availability of investment funds from internal and governmental sources remains limited, and the air transport industry will have to compete for external funds in a climate of a potential global credit squeeze as a result of other demands for financing. Particular difficulties are likely to be encountered in many developing States as a result of national economic conditions and their ability to meet foreign currency obligations.*
3. *At the same time there are particular benefits to be obtained from investment in air transport because of the impact of this sector on other sectors of the economy and, indeed, on the economy as a whole. In addition to generating economic activity in airframe and engine manufacturing as well as the provision of airline, airport and air traffic services, air transport is, for example, an integral tool for conducting much of the world's business, a foundation for the tourist industry (in itself a major economic sector) and a cost-effective means of distributing goods and services. The air transport industry fosters growth in output, added value and employment at rates greater than the economy at large.*
4. *There is a need to find the necessary financing for air transport investment to ensure that traffic growth and the consequential economic benefits are maintained, and to avoid financial polarization between developed and developing countries and their airlines. This study is designed to assist in the solicitation of financing by identifying the scope of the financing problem, the amounts necessary and possible sources, along with procedures for obtaining finance from these sources. In particular, the study attempts to identify, in broad terms, the investment requirements over the next twenty years: a) for fleet renewal and expansion which represents the bulk of airline investment needs; and b) for airports and en-route facilities. The resulting estimates are global in nature. Particular needs will vary from airline to airline and country to country depending on a wide range of factors and can only be determined at the level of the individual airline, airport or country concerned.*
5. *The study was prepared by the ICAO Secretariat in 1991 and is published under the authority of the Secretary General. The study is being distributed to all ICAO Contracting States and to development agencies, financial institutions and other interested organizations.*

### Sources

6. The basic sources of information for the study were the ICAO Digests of Statistics, as well as previous ICAO studies such as *The Economic Situation of Air Transport* (Circular 222, 1989, which includes details of the long-term forecasts used in the present study and information on the factors affecting traffic growth), the *Economic Implications of Future Noise Restrictions on Subsonic Jet Aircraft* (Circular 218, 1989) and, in particular, the *Airport Economics Manual* (Doc 9562, 1991). In addition, information on future fleet acquisition requirements was obtained from aircraft manufacturers, financial institutions and operating lease companies, and material on airport and route facility investment plans and financing by States was acquired through Regional Offices and a preparatory questionnaire for the 1991 ICAO Conference on Airport and Route Facility Management. However, there were some deficiencies in the relevant statistical material and major gaps in available information on the investment plans of States.

7. Another source of information used for the study was the large and constantly updated collection of research material on hand within ICAO, including periodical and occasional publications of national administrations and international organizations, studies prepared by research agencies and individuals, the proceedings of seminars and conferences, and the aviation press. A wide range of informal contacts of the Secretariat in the relevant sectors of the aviation industry and in government was also used.

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# Chapter 1

## MAIN FINDINGS

1. *Traffic Forecasts (Chapter 2)*. On a world-wide basis, traffic in terms of passenger-kilometres performed is expected to grow at a “most likely” annual rate of 6 per cent through to the year 2000 and 5 per cent from 2000 to 2010. Growth in terms of passengers carried, which is an important criterion for airport development, is expected to be at “most likely” average rates of 5 per cent and 4 per cent for the periods 1990-2000 and 2000-2010 respectively for scheduled services. Aircraft departures are expected to rise at a rate of between 2.0 and 2.5 per cent through to the year 2010, a somewhat lower rate than over the past decade. Traffic to, from and within Asia/Pacific is expected to show the highest regional growth.
2. *Aircraft Fleet Projections (Chapter 3)*. It is estimated, consistent with manufacturers’ projections, that some 11 000 commercial jet aircraft will be delivered to airlines and leasing companies over the period 1991-2010. Some 40 per cent of these aircraft will be destined for operation by airlines in North America, and about a quarter each for Asia/Pacific and for Europe. Some 70 per cent of the aircraft demand world-wide is for growth and about 30 per cent is for replacement.
3. *Aircraft Investment Requirements (Chapter 3)*. During the period 1970-1990, the airlines acquired aircraft valued at an estimated U.S. \$340 billion in 1991 dollars. For the period 1991-2010 the 11 000 aircraft which are expected to be acquired world-wide are likely to be valued at some U.S. \$800 billion (1991 dollars) in total. The vast majority of these requirements will be for airlines in three regions: North America (42% of the aircraft and 40% of the value), Asia/Pacific (24% and 28%) and Europe (22% and 23%). The real increase in aircraft investment requirements world-wide needs to be considered against, and is predicated upon, a world economy expanding at a rate of 3 per cent per annum to the year 2000 and 2.5 per cent thereafter. Gross capital investment in the economy tends to increase at a slightly higher rate than gross domestic product, and the relative increase in investment in aircraft over the next 20 years is expected to be only marginally greater than the relative increase in investment in the world economy at large. However, the growth rate in output achieved by the airline industry (for example, the 6 per cent annual growth in passenger-kilometres performed for 1991 to 2000 cited above) is expected to be about twice the growth rate for total economic output.
4. *Airport and Route Facility Infrastructure Investment Requirements (Chapter 5)*. The global investment requirements for airport and route facility infrastructure over the period 1991-2010 are estimated, on the basis of somewhat limited available data, to be in an order of magnitude of between U.S. \$250 and U.S. \$350 billion in 1991 dollars. States in Europe, North America and Asia/Pacific are expected to account for between 75 and 80 per cent of these requirements. It is not feasible to develop conclusions regarding comparable returns on investment as was the case with aircraft investment, not only because of insufficient data, but also because of the tendency for airport capacity expansion to take place in large and irregular steps. Nevertheless, it is evident that the requirements for airport and route facility investment are substantial and that without such investment, as well as the investments in aircraft referred to above, the anticipated growth in airline traffic will not be sustained.

5. *Types and Sources of Financing (Chapters 4 and 6).* Financing investment requirements over the next 20 years presents a serious challenge to civil aviation, not only because of the large capital sums required but also because the costs of financing are increasing in real terms. A wide variety of types of financing is already in existence and further innovation will be required if the air transport industry is to continue to expand.

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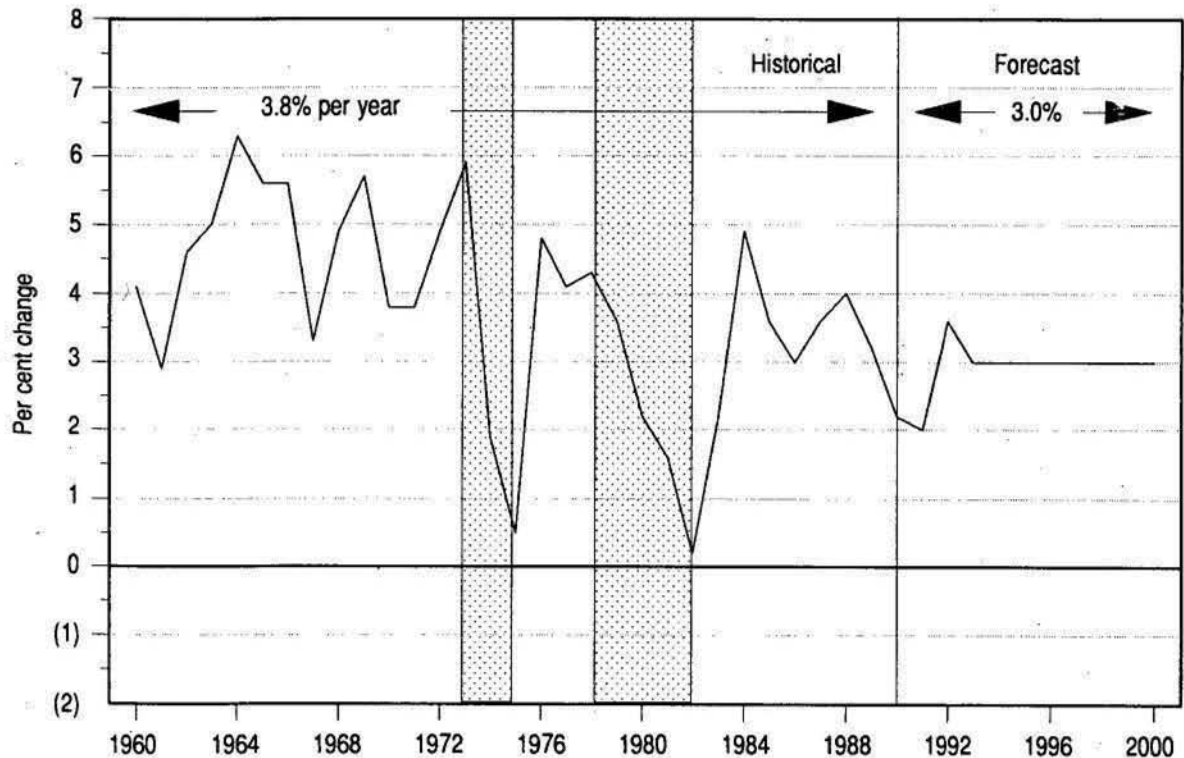


## Chapter 2

# TRAFFIC FORECASTS

1. Traffic forecasts are a basic parameter in determining airline equipment acquisition requirements and airport and route infrastructure developments.
2. The long-term demand for air transport is primarily determined by economic developments, notably income levels and demographics, and specifically by the cost of air travel. World energy demand, supply and prices are important both to economic progress and to the cost of travel. Hence, the airline industry is highly vulnerable to economic cycles and to fuel availability and prices and is also subject to political developments.
3. Over the thirty-year period 1960 to 1990 the world economy in real terms has grown at an average rate of 3.8 per cent per annum. As shown in Figure 1, however, this growth has been subject to several cycles, most notably the recessions between 1973 and 1975 and between 1979 and 1982, both precipitated by the price of crude oil, which increased fivefold in real terms between 1973 and 1983 before achieving relative stability. Over the same thirty-year period, world air travel (in terms of scheduled tonne-kilometres performed, excluding the Russian Federation) grew at an average rate of 9.9 per cent per annum and followed the world economic cycles fairly closely.
4. Following a slowdown in economic growth from 1989, exacerbated in 1990 and 1991 by the situation in the Persian Gulf, most major economies are expected to recover by the end of 1992. Based on economic growth projections developed by the International Monetary Fund (IMF), the World Bank and other major economic forecasting institutions, a real increase in global gross domestic product in the order of 3 per cent annually is expected for the 1990-2000 period, followed by a somewhat slower average annual growth of 2.5 per cent for the period 2000-2010.
5. Long-run crude oil prices adjusted for inflation (i.e. in real terms) are likely to remain near U.S. \$20 per barrel for the 1991-2000 period, according to prevailing industry expectations. Taking into account this assumption regarding a significant component of airline operating costs, air fares are expected to continue to remain fairly stable, increasing at a rate close to inflation.
6. In order to establish a basis for estimating future fleet acquisition and airport development needs, these assumptions have been incorporated in econometric analyses carried out to extend the forecasts of scheduled passenger traffic published in 1989 in Circular 222 — *The Economic Situation of Air Transport* — through to the year 2010; while non-scheduled and freight traffic are, of course, also determinants of investment requirements, they tend to play a secondary role to passenger traffic. The resulting forecasts are consistent with projections by major airframe and engine manufacturers. All these forecasts are of the *demand* for air transport based on the scenarios of economic growth, price expectations and other pertinent factors as described in Circular 222. The forecasts are based on the perceived ability of civil aviation to meet supply-side constraints such as airport and airspace congestion and to achieve the financing indicated in this study.





Source: ICAO forecast based on World Bank, IMF, Wharton Econometrics and other economic services.

**Figure 1. World economic growth (GDP in real terms)**

7. On a world-wide basis, traffic in terms of passenger-kilometres is expected to grow at a “most likely” annual rate of 6 per cent through to the year 2000 and 5 per cent from 2000 to 2010, the “high” and “low” forecasts being some two percentage points above and below the “most likely” rate. The “most likely” forecasts of this scheduled passenger traffic for airlines registered in each ICAO region, together with historical traffic, growth rates and regional market shares, are depicted in Table 1. The airlines registered in the Asia/Pacific Region are expected to show the highest growth in traffic over the period 1990-2010, resulting in their regional share of the world scheduled traffic increasing from 18 per cent in 1988 to about 26 per cent in 2000 and reaching almost 32 per cent by the year 2010.

8. Growth in terms of passengers carried, which is an important criterion for airport development, is expected to be lower than in terms of passenger-kilometres, because the latter includes the effect of a gradual increase in average passenger trip distance at an annual rate of approximately 1 per cent. The numbers of passengers carried on scheduled services are forecast to grow at “most likely” average annual growth rates of 5 per cent and 4 per cent for the periods 1990-2000 and 2000-2010 respectively, as illustrated in Table 2. This would result in the numbers of passengers increasing from just under 1.2 billion in 1990 to nearly 2 billion by the year 2000 and about 2.8 billion by the year 2010.

9. Apart from passenger traffic, a key determinant in airport and route facility planning is, of course, the number of aircraft movements. However, long-term forecasting of aircraft movements is complex because, in addition to passenger- and freight-traffic growth, it is affected by airline fleet mix, airport and airspace capacity, and airline network development, amongst other factors, and the relative impact of these factors can vary, not only from region to region but from airport to airport and airspace to airspace. On a world-wide basis, excluding the Russian Federation, aircraft movements in terms of aircraft departures increased at an average annual rate of 2.7 per cent between 1979 and 1989, and it is estimated that this rate will fall to between 2.0 and 2.5 per cent for the period through to the year 2010 because of somewhat slower traffic growth and an increase in the average size of aircraft.

**Table 1. Forecast of scheduled passenger traffic by region  
(Region of airline registration, ICAO Contracting States)**

	Passenger-kilometres (thousand millions)				Average annual growth rate (per cent)			Regional share of world traffic (per cent)			
	Actual		Forecast		1978 to 1988	1988 <sup>1</sup> to 2000	2000 <sup>1</sup> to 2010	1978	1988	2000	2010
	1978	1988	2000	2010							
Africa	24	38	60	86	4.7	4.0	3.5	2.6	2.2	1.7	1.5
International	19	29	49	72	4.3	4.5	4.0	4.9	3.8	2.8	2.3
Domestic	5	9	11	14	6.1	2.0	2.5	0.9	1.0	0.6	0.6
Asia/Pacific	126	309	900	1 804	9.4	9.0	7.0	13.4	18.1	26.1	31.8
International	78	210	680	1 402	10.4	10.5	7.5	20.3	27.6	39.1	45.0
Domestic	48	99	220	402	7.5	7.0	6.0	8.7	10.5	12.9	15.7
Europe	321	508	850	1 270	4.7	4.5	4.0	34.3	29.8	24.6	22.4
International	163	261	450	705	4.8	4.5	4.5	42.3	34.3	25.9	22.7
Domestic	158	247	400	565	4.6	4.0	3.5	28.6	26.2	23.4	22.1
Middle East	26	46	85	138	5.9	5.0	5.0	2.8	2.7	2.5	2.4
International	21	37	70	117	5.8	5.5	5.5	5.5	4.9	4.0	3.8
Domestic	5	9	15	21	6.1	4.5	3.5	0.9	1.0	0.9	0.8
North America	393	726	1 415	2 156	6.3	5.5	4.5	41.9	42.6	41.0	38.0
International	78	180	405	679	8.7	7.0	5.5	20.3	23.6	23.3	21.8
Domestic	315	546	1 010	1 477	5.7	5.5	4.0	57.1	57.8	59.1	57.7
Latin America and Caribbean	47	79	140	217	5.3	5.0	4.5	5.0	4.6	4.1	3.8
International	26	45	86	137	5.6	5.5	5.0	6.8	5.9	4.9	4.4
Domestic	21	34	54	80	4.9	4.0	4.0	3.8	3.6	3.2	3.1
World	937	1 706	3 450	5 672	6.2	6.0	5.0	100.0	100.0	100.0	100.0
International	385	762	1 740	3 113	7.1	7.0	6.0	100.0	100.0	100.0	100.0
Domestic	552	944	1 710	2 559	5.5	5.0	4.0	100.0	100.0	100.0	100.0

1. Rounded to the nearest 0.5 percentage point.

Source: ICAO Circular 222, *The Economic Situation of Air Transport (1989)*, with forecasts using the same methodology extended from the year 2000 to 2010.

**Table 2. ICAO scheduled passengers carried forecast to the year 2010  
(ICAO Contracting States)**

	Actual		Forecast		Average annual growth		
	1978	1988	2000	2010	1978-1988	1988-2000 <sup>1</sup>	2000-2010 <sup>1</sup>
	(millions)		(millions)		(per cent)		
Passengers carried							
Scheduled services	679	1 072	1 945	2 810	4.7	5.0	4.0
International	143	232	480	785	5.0	6.0	5.0
Domestic	536	840	1 465	2 025	4.6	4.5	3.5

1. Rounded to the nearest 0.5 percentage point.

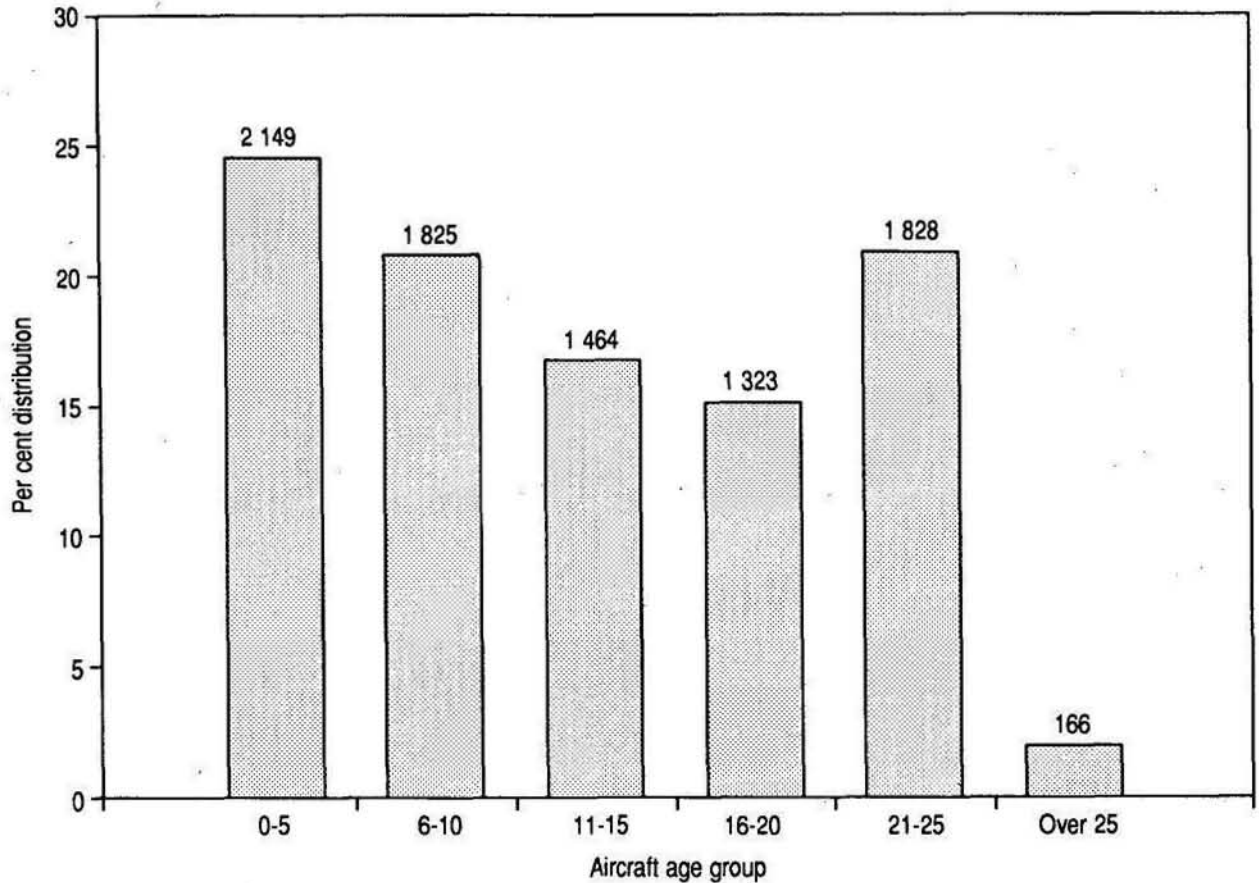
Source: ICAO Circular 222, *The Economic Situation of Air Transport (1989)*, with forecasts using the same methodology extended from the year 2000 to 2010.

## Chapter 3

# AIRCRAFT FLEET PROJECTIONS AND INVESTMENT REQUIREMENTS

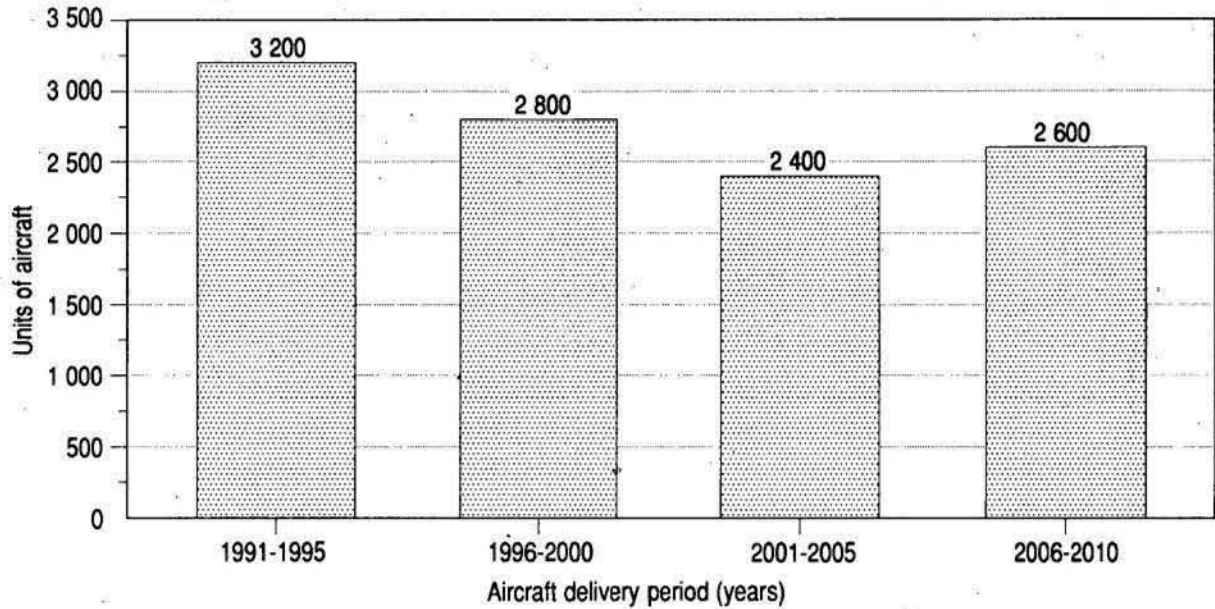
1. Traffic growth and fleet retirement patterns are the primary factors influencing aircraft acquisition. Other factors include seating density, aircraft utilization and load factor expectations, and external parameters such as operating restrictions due to noise legislation and problems of congestion which will affect aircraft fleet mix.
2. For the purpose of the present study, estimates of aircraft deliveries through to the year 2010 have been made on the basis of manufacturers' projections and consistent with the "most likely" traffic forecasts presented above and analyses of fleet retirement patterns carried out for an ICAO study on the *Economic Implications of Future Noise Restrictions on Subsonic Jet Aircraft* (Circular 218, 1989). The age distribution of the world commercial jet aircraft fleet, updated from that study to December 1989, is illustrated in Figure 2.
3. It is estimated that some 11 000 commercial jet aircraft will be delivered to airlines and leasing companies world-wide over the period 1991-2010. The large part of the aircraft demand is for growth with a smaller proportion for replacement of existing aircraft. Aircraft deliveries for each of the four five-year periods concerned are shown in Figure 3.
4. The requirements for each region depend on the traffic forecasts for the region presented in Chapter 2, the fleet mix for the region and the present age distribution of aircraft in the region. An indication of the variations in age distribution is given by the differing average age of aircraft in each region as illustrated in Figure 4.
5. Taking the above factors into account, the forecasts of the number of aircraft deliveries for each ICAO region are shown in Figure 5.
6. During the period 1970-1990 the airlines acquired, directly and/or through leasing companies and other means, about 8 000 aircraft valued at an estimated U.S. \$340 billion (1991 dollars). For the period 1991-2010, the 11 000 aircraft which are expected to be acquired world-wide are likely to be valued at some U.S. \$800 billion (1991 dollars) in total, or over 2.3 times the total for the previous 20 years. This is equivalent to an annual average investment of U.S. \$40 billion for the forecast period compared to an average outlay of U.S. \$16 billion a year during 1970-1990. The total investment of U.S. \$340 billion (1991 dollars) is equivalent to .095 per cent of the cumulative total world GDP expressed in 1991 dollars for the period 1970-1990. For the forecast horizon, the investment requirements of U.S. \$800 billion (1991 dollars) are equivalent to .130 per cent of the forecast GDP for the period 1991-2010.
7. The regional breakdown of these aircraft acquisitions by value for the period 1970-1990, together with the requirements for the period 1991-2010, are shown in Figure 6. This breakdown is according to usage by airlines based in each region concerned – many aircraft may actually be registered elsewhere and, for example, leased to an airline of the region. Large increases in requirements for the next 20 years over the past 20 years are anticipated for all regions except the Middle East, the greatest increases being for the Asia/Pacific and Latin America/Caribbean Regions.

8. The historic and forecast regional shares of the world total investment for fleet acquisition are depicted in Figure 7. The Asia/Pacific share is expected to increase from 21 per cent over the past 20 years to 28 per cent for the next 20 years and the Latin America/Caribbean share from 2.9 to 4.0 per cent, with the share of other regions decreasing by differing amounts. There are differences between these shares by value and the shares in aircraft acquisition because of the differing types, and particularly sizes, of aircraft to be acquired.



Source: ICAO estimates, based on information from aircraft manufacturers.

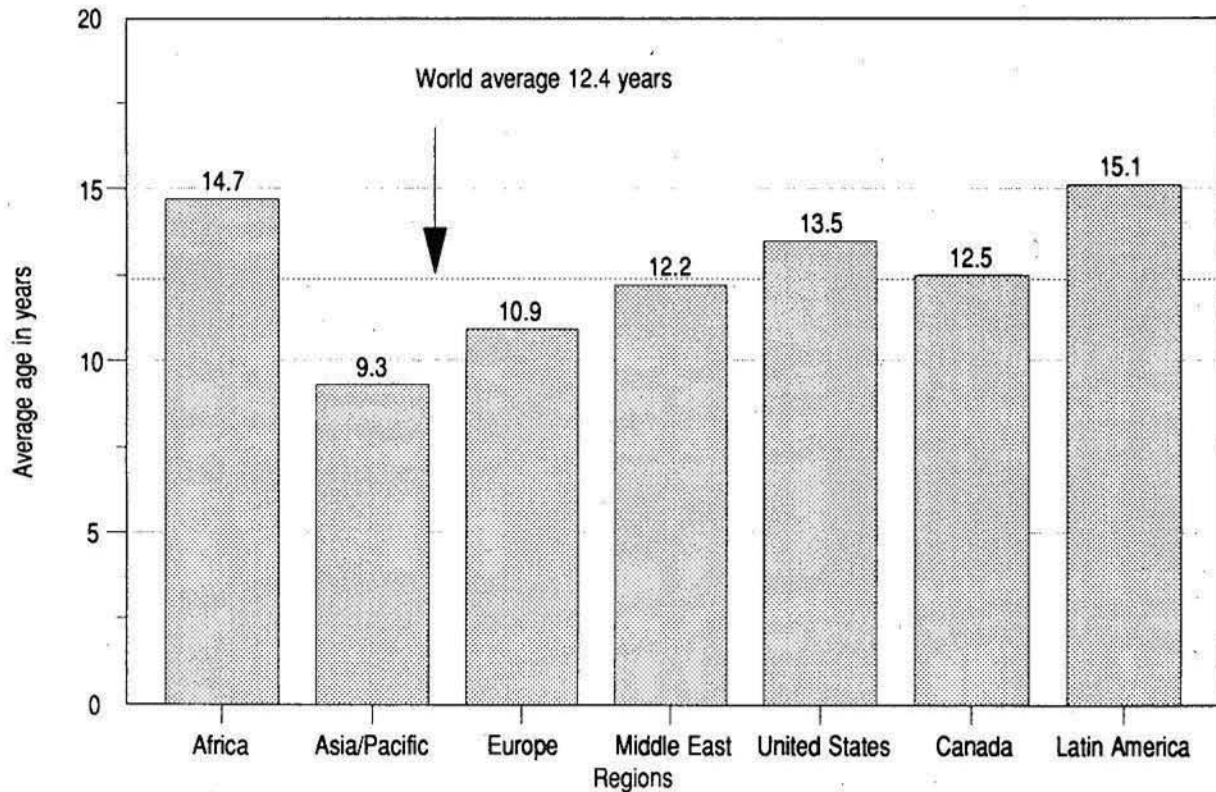
**Figure 2. Age distribution of commercial jet aircraft fleet (December 1989)**



Cumulative total 1991 to 2010 = 11 000 aircraft

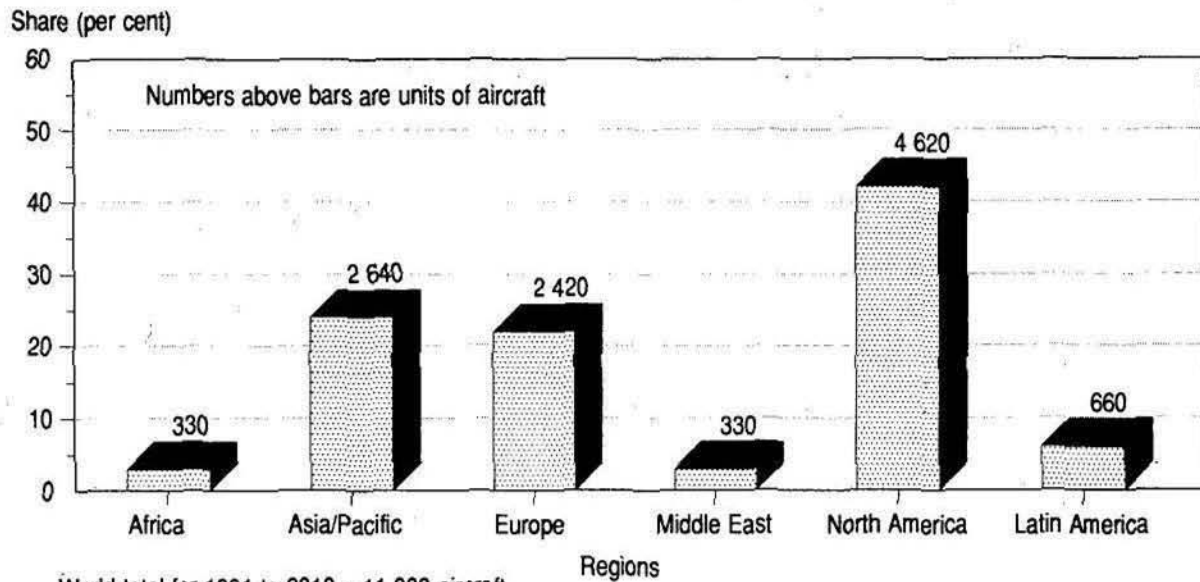
Source: ICAO estimates, based on information from aircraft manufacturers.

**Figure 3. Commercial jet aircraft delivery forecast (1991-2010)**



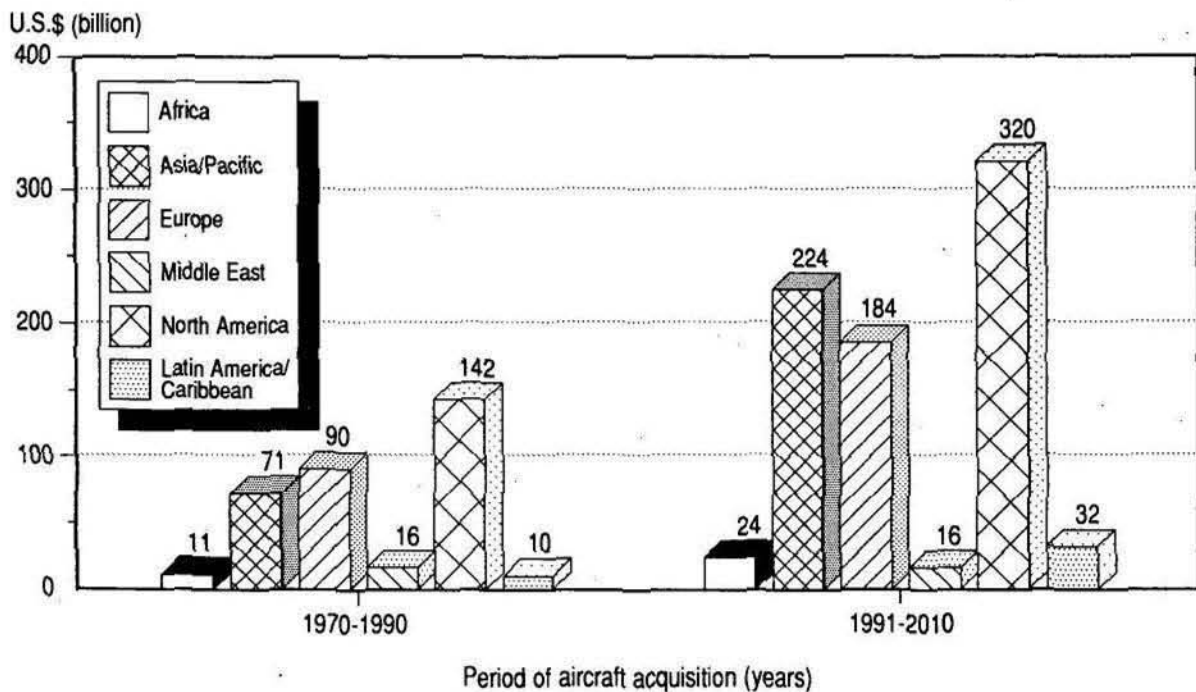
Source: ICAO estimates, based on information from aircraft manufacturers.

**Figure 4. Average age of commercial jet aircraft fleets by region (December 1989)  
(Region of carrier registration, ICAO Contracting States)**



Source: ICAO estimates, based on information from aircraft manufacturers.

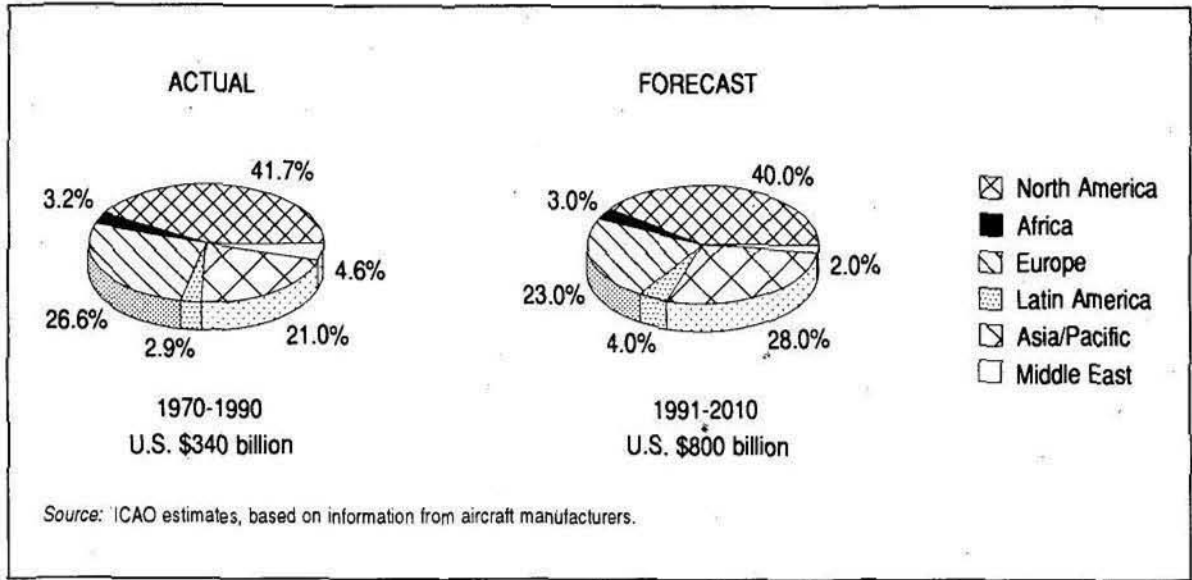
**Figure 5. Commercial jet aircraft acquisition – requirements by region (1991-2010)**  
(Region of carrier registration, ICAO Contracting States)



Source: ICAO estimates, based on information from aircraft manufacturers.

**Figure 6. Commercial jet aircraft acquisition – value by region**  
(Region of carrier registration, ICAO Contracting States)





**Figure 7. Commercial jet aircraft acquisition  
(Dollar value distribution by region)**

## Chapter 4

# TYPES AND SOURCES OF AIRCRAFT FINANCING

1. *Financing the world-wide aircraft investment requirement of around U.S. \$800 billion over the next 20 years presents a serious challenge to the airline industry as a whole, primarily because the requirement reflects aircraft price increases which are outstripping general inflationary trends.*
2. *Airline earnings tend to be cyclical and industry returns on investment generally have been poor. With a few notable exceptions, airline cash flows over the long term have been inadequate to meet capital requirements. At the same time, the ratio of debt to equity for many airlines has increased to levels which have had a negative impact on their creditworthiness. This has not only limited access by these airlines to external funds, but has also led to larger commitment fees and progress payment requirements from manufacturers — as much as 25 per cent of the aircraft price in a three-to-four year period before delivery — as well as increased charges for continued financing.*
3. *As a consequence, airlines are increasingly moving away from conventional methods of financing, such as from internal sources and from external loans or raising of capital, and turning to leasing arrangements in a variety of forms. In fact, there is some consensus in the industry that conventional methods of financing will in future only provide between one-third and one-half of the financial requirements for aircraft acquisition.*
4. *The text below briefly describes developments in conventional methods and sources of financing, including cash flow from operations, converting existing assets (both internal financing), equity financing, debt financing and manufacturers' support, before focusing in some detail on leasing arrangements. Finally, particular treatment is given to the special features of financing for carriers of developing States. A listing of institutions playing an important role in financing civil aviation developments, covering aircraft and/or infrastructure, is contained in Appendix 2.*

### CASH FLOW FROM OPERATIONS

5. *Currently, most airlines are unable to generate sufficient reserves from their depreciation charges and retained earnings to finance aircraft acquisition. Cash flows have also been affected by reductions in depreciation allowances and investment tax credits associated with tax reforms in many countries. Industry-wide, cash reserves might fill almost a quarter of future aircraft investment needs, but these reserves are not evenly distributed amongst airlines and, for some, the availability of cash for investment is virtually negligible.*

## CONVERTING EXISTING ASSETS

6. This relatively new way of obtaining cash for financing aircraft is linked to the development of leasing and has some advantages when the second-hand market is buoyant. It can take the form of an outright sale of equipment or a sale and leaseback. The latter type of transaction allows airlines to use the generally appreciated value of aircraft to finance additional aircraft, to remove older aircraft from balance sheets while values are still high, to finance investment in other airlines and/or to finance their own internal operations (in the case of under-capitalized airlines).

7. Many leasing companies have created business through sale and leaseback transactions. Some airlines have even created their own leasing companies to which they sell their aircraft, leasing the same aircraft back from these companies. It seems, however, that the current cycle of high residual value for second-hand aircraft has passed its peak, particularly in the case of aircraft which exceed noise levels in Annex 16, Volume 4, Chapter 3. Consequently, this source of financing might be much more limited in the future.

## EQUITY FINANCING

8. Airlines are often able to raise capital from offerings of new equity such as stocks. Equity is in practice available almost exclusively to "financially strong" airlines, however, and most airlines remain under-capitalized. Thus, they are unlikely to be able to raise enough in the way of equity to finance substantial orders for aircraft.

## DEBT FINANCING

9. Investments are more often debt-financed (i.e. financed by loans and other forms of borrowing from financial institutions) than equity-financed. Depending upon the financial viability of a company and the perceived risk involved, debt may be either unsecured or secured by the assets concerned, hence the term "asset-based financing". In practice, increasing debt-equity ratios and occasional bankruptcies have led to a shift towards asset-based financing in the airline industry; debt bonds and related asset-linked securities are the only public offerings that still attract much attention. The debt market is large in the United States where insurance companies and pension funds have strong cash assets to place, but it is sensitive to the general economic environment and within it both airlines and leasing companies compete for the same resources.

10. One consequence of the increasing indebtedness of airlines is the importance taken by "risk" to the lender and the availability and cost of insurance against such risk. Risk is closely examined by financial institutions which participate in aerospace financing, notably banks and insurance companies. They consider the type of risk, such as cash-flow risk, equipment risk, "political" risk and public liability, and price their loans accordingly. The lower the risk, and the better the airline financial situation, the more accessible and less costly the financing the airline can obtain from lenders.

11. Sales of aircraft internationally have benefitted significantly from support of debt financing by "export credit" schemes devised by governments to subsidize loans and thereby encourage exporting. In view of the perceived risks involved in international financial transactions, these credit schemes are generally linked with risk coverage (insurance and/or guarantee) for the lender by specialized public agencies such as the Export/Import Bank (EXIMBANK) in the United States, Export Credits Guarantee Department (ECGD) in the United Kingdom, Compagnie Française d'Assurance pour le Commerce Extérieur (COFACE) in France and HERMES in Germany.

12. The volatility of interest rates and increasing availability of new forms of financing, however, have somewhat reduced the advantage formerly provided by export credit arrangements, which have not always been adapted to reflect features specific to aircraft financing (for example, to offer extended credit terms to reflect the relatively lengthy life of aircraft or to offer flexible conditions as regards aircraft leasing transactions). In addition, the risk coverage has generally been limited to direct sale, or to financial lease, which is discussed below, the public agencies being reluctant to provide more sophisticated coverage such as repossession insurance on a long-term basis or insurance on complex lease transactions.

13. Nevertheless, export credit remains attractive in view of the public backing concerned and the flexibility retained by the carrier of being able to sell or sub-lease the aircraft acquired. Hence, export credit is likely to remain a significant feature in financing aircraft procurement.

### MANUFACTURERS' SUPPORT

14. Manufacturers are increasingly offering financial support as an inducement in the competitive environment of aircraft marketing. Traditionally, aircraft manufacturers have granted support to customers through various means, including the arrangement or provision of equity financing, purchase of stock options and guarantees for debt financing to financial institutions. With the increasing sophistication of financing techniques, manufacturers are becoming involved in complex leasing and other arrangements.

### LEASING ARRANGEMENTS

15. Leasing arrangements have permitted airlines to obtain the use of aircraft without having to make down payments or incur heavy capital outlays, while lessors have been assured the security of ownership of the equipment and an attractive return from a combination of tax benefits, payment of interest on the investment and, in certain cases, the residual value of the equipment at the end of the lease term, which may have actually increased. Other factors which have promoted the use of leasing in recent years include protection for lessors since lease payments have, in some cases, been kept out of country debt rescheduling and, primarily in the United States, protection for lessees against financial "raiders" since leased aircraft cannot be sold as an asset.

16. Leasing does have its drawbacks, however, for example limited personalization of aircraft to individual airline standards and identity, increased financial overheads and, frequently, increased operating costs, depending on the lease transaction concerned. The attractiveness of leasing versus conventional financing, or of one over another of the various derivatives of either form of financing, will vary from airline to airline and from time period to time period, depending on a range of localized factors.

17. There is a wide variety of types of leasing arrangements in existence, but in essence they are all derivatives of two basic types — the financial or capital lease and the operating lease. Under the financial lease, the benefits and risks associated with ownership are transferred to the lessee at the end of the lease, which tends to be for 12 to 20 year periods; under the operating lease, the lessee merely has the use of the property, usually for a relatively short period of up to seven years. Cross-border leasing (across national borders), in addition to increasing the financing options for aircraft, has also often provided significant tax benefits.

18. Financial lease obligations are reported as long-term debt on the carrier's balance sheet while operating leases are not, an important consideration for an airline which may already have a high debt-equity ratio.

Nevertheless, financial leases offer opportunities for lessors willing to take risks on residual values rather than on airline creditworthiness. Financial leases have consequently been widely used in some markets, mostly in the United States, where tax advantages have led to financing through such sources as banks, insurance companies and financial service subsidiaries of corporations. Financial leases are becoming more and more difficult to create, however, due to a tightening of monetary policies world-wide and new tax legislation implemented in many source countries such as Japan, the United States and Western European countries.

19. Operating leases are attractive to carriers not only in terms of balance sheet presentation, but also because of the high degree of flexibility they offer as regards fleet planning. Their use has increased rapidly over the past 10 years, fostered by the evolution of specialist operating lease companies, the largest of these being Ansett Worldwide Aviation Services, GATX-Credit Lyonnais, Guinness Peat Aviation (GPA) and International Lease Finance Corporation (ILFC).

20. Specialist operating lease companies play an important role in the air transport industry, acting as intermediaries amongst the lessee airlines, the financial institutions, the manufacturers and other airlines, and have resulted in operating leases becoming available on a world-wide basis. Operating lease companies provide increasingly comprehensive services, including maintenance, marketing, etc., in addition to financial expertise. Operating lease companies have been able to obtain and offer advantageous financing based on their own equity position, as well as advantageous aircraft prices as a result of bulk purchases and the strength of their marketing and remarketing management.

21. Operating lease companies have also been able to offer a unique service in recent years, namely access to the order-book and delivery positions of manufacturers whose capacity was fully subscribed. Operating lease companies are currently ordering about a fifth of new aircraft being produced, and this share of equipment acquisition is expected to rise to about a quarter in the coming decade. These companies are thus in a position where they can exercise a substantial degree of market power in the airline industry.

22. Growing reliance on the operating lease as a means of obtaining the use of aircraft raises the danger that any development in the future that reduces profitability of operating leases (for example, a significant decline in the resale value of used aircraft) could endanger the viability of the lessors, with consequences for airline lessees, including a possible reduction in the availability of this type of aircraft financing. On the other hand, the operating lease companies already have a wide range of customers, and therefore risk, and their role could be reinforced given continued weak balance sheets of airlines and a continued world-wide credit squeeze.

### AIRLINE FINANCIAL STRUCTURE

23. The method of financing new equipment will affect airline costs, as well as the financial structure of airlines and the pattern of their liabilities. The debt/equity ratio is one of the concepts used to describe a company's financial condition, although its measurement will depend on the accounting conventions and valuation methods employed.

24. The expansion of debt financing in the 1980s, and the fall in asset values associated with the recession, have tended to increase debt/equity ratios and raise the financial risks facing airlines. On the other hand, the expansion of leasing has had the reverse effect of helping to reduce the debt/equity ratio. The quantification of these trends is a complex task and has not been possible in this study.



## FINANCING FOR CARRIERS OF DEVELOPING STATES

25. The aircraft investment needs of carriers from developing countries over the next 20 years are relatively modest in terms of the world picture, and are even more so when the requirements of a few major carriers in the Asia/Pacific Region are excluded. Many carriers of developing States, however, already encounter serious difficulties in financing the acquisition of aircraft and their investment requirements over the next 20 years will be some 2.7 times higher than the financing requirements of the previous 20 years. Even an airline which is well managed is affected by the general economic situation of its home State. This bears on the availability and cost to the carrier of finance from commercial banks, on its ability to obtain traditional export financing and credit guarantees, and on its ability to obtain foreign exchange to repay obligations. Obligations denominated in foreign currency may be especially hard to meet when domestic inflation is high and the national currency is subject to frequent adjustments. Furthermore, the cost of modern aircraft is such that fewer governments of developing countries appear to be able or prepared to provide subsidies, loans and loan guarantees to their air carriers.
26. Potential relief for carriers of developing countries takes several forms. To reduce the cost of repaying loans, suggestions have been made to amend the Organization for Economic Co-operation and Development's (OECD) Large Aircraft Sales Understanding (LASU, see Appendix 1) to extend the twelve-year limitation on officially guaranteed credits. Also, measures being adopted to ease the debt repayment difficulties of some developing countries include so-called debt-equity swaps involving the cancellation of debt by foreign creditors in return for equity or physical assets, which in theory could be applied to airline assets.
27. At the same time, operating leases are becoming particularly important in enabling the carriers of developing countries to obtain the use of aircraft. A special advantage of leasing in the case of developing States is that it can permit them to become less involved in financing air transport by shifting the burden to the private sector and transforming the risk involved from a country risk to an asset risk. Lessors can, however, perceive this asset risk to be higher in the case of some developing countries than for other countries, given a danger that it may not be possible, for legal and/or political reasons, for the lessor to repossess a leased aircraft should this become necessary. Lessors, therefore, may apply higher leasing costs for the carriers concerned and sometimes impose conditions such as use of aircraft solely on international routes, maintenance outside the state of domicile of the carrier and insistence on the carrier taking out repossession insurance, which can be costly.
28. Means of reducing perceived risks to the lessor and the related costs to the lessee have been suggested in the form of applying the World Bank's Multilateral Investment Guarantee Agency (MIGA) to aircraft transactions and of establishing commercially-sponsored trusts or guarantees.
29. There are also several proposals for the establishment of regional leasing companies based in developing countries, aimed at asserting increased regional control over aircraft ownership, registration and maintenance, as well as providing financing attuned more closely to the special conditions of the regions concerned. For example, in 1988 a tentative agreement was reached among 14 Arab airlines and 5 banks to form the Arab Aviation Finance Company. This consortium would purchase by 1995 up to 220 new aircraft, 50 to meet growth needs and 170 as replacements, valued at as much as U.S. \$10 billion. The African Development Bank expects to conduct a feasibility study on the establishment of an aircraft purchasing and leasing company for African airlines. The Southern African Development and Co-ordinating Conference (SADCC) countries are also, with the assistance of the World Bank, examining the feasibility of developing a leasing company.

## Chapter 5

# AIRPORT AND ROUTE FACILITY INFRASTRUCTURE INVESTMENT REQUIREMENTS

1. Estimates of capital requirements for airport and route facility infrastructure up to the year 2010 can only be expressed in terms of approximations of broad global orders of magnitude. There are many reasons for this, but probably most important is that the majority of States do not appear to have developed infrastructure investment plans beyond the next five to seven years. Also, even where such plans exist they tend to be in the form of technical descriptions or specifications of facility requirements without estimates being provided concerning the cost of implementation. It should be noted that while traffic forecasts are of primary importance in estimating airport and route facility requirements, capacity expansion tends to take place in large, costly and often irregular steps; and long lead times are also usually involved in significant renewal or expansion projects, particularly those for airports.
2. On the basis of information collected from States and various other sources, airport and route facility infrastructure requirements up to the year 2010 are estimated to be in the order of between U.S. \$250 and U.S. \$350 billion, in 1991 dollar values. Of this amount, about U.S. \$100 billion is accounted for by 43 airport projects, each exceeding U.S. \$500 million, involving new airports or major expansions. In fact, airport projects are generally expected to account for a considerably larger proportion of the total infrastructure investment requirements than route facility projects. Although it is not feasible to provide a regional breakdown of these estimates, States in Europe, North America and Asia/Pacific are expected to account for between 75 and 80 per cent of the total infrastructure investment requirements.
3. The estimated investment requirements take into account those expected to arise from the implementation of the global satellite-based communications, navigation and surveillance (CNS) and air traffic management (ATM) system concept recently endorsed by the international civil aviation community through ICAO. The estimates, however, do not take into account the extent to which airport and route facility infrastructure requirements could be influenced by future action aimed at reducing or eliminating adverse environmental consequences of civil aviation.
4. Various factors, in particular resource availability, will determine the extent to which the additional requirements can actually be financed and implemented. Also to be considered in the context of future requirements is that the saturation point of existing facilities, particularly airports, has tended to be underestimated.



## Chapter 6

# TYPES AND SOURCES OF FINANCING AIRPORT AND ROUTE FACILITY INFRASTRUCTURE

### BASIC CHARACTERISTICS

#### Over-all financial situation

1. The financing of airports and route facilities differs in many essential respects from aircraft financing. A basic reason for this difference is that the airline industry as a whole has tended to be profitable; although operating results are cyclical, considerable differences exist between individual airlines, and industry returns on investment generally have been poor. In 1989, for example, about three-quarters of the scheduled airlines experienced operating profits and one-quarter reported operating losses. In contrast, the large majority of international airports and route facilities are operated at a loss. While a growing number of airports are profitable, notably major international airports in Europe, North America and to a lesser extent in South East Asia and the Pacific, airports and route facilities in general are not expected to generate sufficient revenues to cover all their costs, including capital cost, in the foreseeable future. This has placed restrictions on the extent to which the airport and route facility operators can finance their renewal and expansion requirements from retained earnings and also restricts their access to commercial loans unless acceptable government guarantees can be provided.

#### Capacity development characteristics

2. Another important factor affecting the financing of airport and route facility infrastructure is the manner in which capacity expansion must take place. Unlike airline fleet capacity which can frequently be fairly well adjusted to traffic development through the acquisition of different numbers of aircraft of different sizes and by adjusting the utilization of different aircraft in the fleet, airport and, to a lesser extent, route facility capacity expansion usually take place in large and costly steps. Moreover, the investments involved are essentially non-reversible (a new runway, passenger terminal, air traffic control centre, communications centre, etc.) and take a relatively long time to complete. Such investments, which are usually intended to provide capacity for a considerable future period of time, normally do not reach the break-even point, if they do at all, until after a number of years following their completion when traffic volume and utilization have reached the required levels.

3. These large, non-reversible investments and the fact that most if not all States need to have a basic international airport and route facility infrastructure, regardless as to whether very small or relatively large volumes of traffic are to be served, are the basic reasons for the losses incurred by large numbers of airports and route facilities. This applies in many States, particularly those outside Western Europe and North America, where there is under-utilization of such facilities, a situation which is expected to prevail for years to come. This places constraints on the sources available to finance investments in these facilities.

### Organizational aspects

4. A majority of airports are operated by a civil aviation administration, ministry or other government department. However, the number of airports that are operated by autonomous authorities is increasing and they are now located all over the world. With the exception of one authority known to be fully privately owned and operated, such authorities are essentially government owned, although some airport functions, such as aircraft handling and cargo terminals, may be privately operated.
5. Route facilities are normally government owned and operated and the majority are operated by civil aviation administrations. There is, however, a growing tendency to assign major functions involved, principally air traffic services and communications, to a separate autonomous authority. Meteorological services, on the other hand, are normally operated by a completely separate branch of government.
6. An important characteristic of some autonomous authorities operating route facilities is that the scope of their functions has an international dimension not found in authorities that only operate airports. This has arisen in circumstances where there have been problems in the provision of route facilities due to technical factors and operational constraints that could not be adequately solved without international co-operation. This has led to the establishment of autonomous international authorities, usually referred to as international operating agencies, to which the operation of route facilities and services has been assigned.
7. Examples of such agencies are the Corporación Centroamericana de Servicios de Navegación Aérea (COCESNA) in Central America and the European Organization for the Safety of Air Navigation (EUROCONTROL). Another closely related example is the Agence pour la Sécurité de la Navigation Aérienne en Afrique et à Madagascar (ASECNA) in Africa, which operates both route facilities and airports. A closely related development is that of the multinational facility/service which is a facility or service that is to serve international air navigation in airspace extending beyond the airspace served by a single State. Elements of the satellite communications system required to implement the satellite-based communications, navigation and surveillance (CNS) and air traffic management (ATM) system concept adopted by ICAO represent one example of prospective multinational air navigation facilities and services.
8. World-wide experience gained from the operation of autonomous authorities has shown that, where airports and route facilities have been operated by such authorities, their over-all financial situation has tended to improve. This has been more pronounced in the case of airports. It has, however, proven essential in the establishment of such authorities that their management be empowered to manage and use the revenues generated to meet the authority costs.
9. As stated above, privately-owned autonomous airport authorities are a rare exception, and privately-operated route facilities and services providing full air traffic control, communications, meteorological and other services are not known to exist, although privately-owned companies may provide elements of these services. Little change is expected in this regard with respect to route facilities. As the number of airports becoming profitable increases, however, some of these could become more attractive to private investors and to States that wish to place on their airports the responsibility for obtaining and servicing their financing requirements. Privatization has been seen as one alternative to achieving this where conditions permit. Nevertheless, it should be noted that a government-owned authority can also offer such benefits provided it is granted the necessary freedom of action. The decisions made by individual States as to the organizational format under which their airports should operate will, however, depend on the situation in the State concerned and will often be strongly influenced by government policy.
10. In more general terms, the existence of an autonomous authority, whether privatized or not, should facilitate financing. This is because an effectively managed autonomous authority has its own accounts and budgets,

thereby providing for greater transparency of its financial situation. Also, for example, where authority management is vested with the necessary financial autonomy, it tends to exercise close control over revenues and costs and encourages development of new sources of revenue. Such factors inspire greater confidence in prospective lenders and can affect terms of financing being sought, or even possibly whether or not a loan is granted.

### SOURCES OF FINANCING

11. For the reasons stated above, the sources of financing available for airports and route facilities tend to be different from those available for aircraft financing. Financing of airports and route facilities rely much more on governmental sources, whether national or foreign, and less on commercial institutions. The importance of government sources is illustrated in Appendix 3, which shows the primary sources of financing for airports in 67 States and for route facilities in 66 States. (States were asked about their practices in this regard in a questionnaire circulated in preparation for the 1991 Conference on Airport and Route Facility Management.) The results of this survey are summarized for airports in Table 3 and route facilities in Table 4. Both tables show the leading role played by government financing, but they also indicate the significance of self-financing in many States. As may be expected, loans from various sources are also important. In the majority of States, two or more sources are used to finance airport and route facility infrastructure.

12. The major sources for financing airports and route facilities are further elaborated on in the text below, which is based extensively on Chapter 7 — Financing Airport Infrastructure, of the *Airport Economics Manual* (Doc 9562). In conclusion, a brief reference is also made to the repayment of loans.

13. Potential sources of funds will vary considerably from one State to another, and which of them are to be approached will depend on the project concerned. Most common are government sources which include funds provided by the government directly as well as through government-owned or government-sponsored financial institutions, including development or export-promoting agencies. The national government, or one or more foreign governments, or international governmental institutions or agencies may be involved. Financing through commercial loans, often the most expensive form of financing airport investment projects, is less common.

**Table 3. Primary sources for financing airports  
in 67 States**

	<i>Number of States</i>
Self-financing	40
National government	44
Regional/municipal government	10
Foreign government loans or aid	24
International development banks or funds	15
Commercial loans	
Domestic	16
Foreign	9
Other	6

**Table 4. Primary sources for financing route facilities  
in 66 States**

	<i>Number of States</i>
Self-financing	33
National government	47
Foreign government loans or aid	22
International development banks or funds	11
Commercial loans	
Domestic	9
Foreign	8
Other	1

#### **Domestic sources**

14. Costs to be met in domestic currency may be financed through sources within the State itself, including government loans or grants, commercial loans through banks and other domestic financial institutions, and credit extended by contractors and other firms engaged in particular projects. Also relevant for airports is income from the sale of airport land, particularly where a new airport will replace an existing airport, the site of which can then be sold. Government assistance in the form of interest-free loans or even grants has been sought in recognition of the local, regional and national benefits derived from the airport's existence and development.

#### **Foreign sources**

##### ***General***

15. Project costs payable in foreign funds constitute a demand on the State's foreign exchange reserves and therefore the financing is usually arranged through the appropriate government authorities or with their approval. For most States, particularly developing States, foreign sources of financing are principally government-operated and include bilateral institutions, development banks and funds, and foreign commercial sources such as commercial banks, contractors and suppliers.

##### ***Bilateral institutions***

16. Financing from foreign sources may be available from foreign governments in the form of loans negotiated directly with the government of the recipient country, or may otherwise be facilitated by particular government agencies established for the primary purpose of promoting exports. The development of transport facilities and the consequential benefits to the national economy expected from a given project may encourage such assistance for various reasons. Amongst them is a wish to facilitate the export of technology and equipment required for a particular project as well as the desire to promote trade and cultural relations between the two countries concerned. Such assistance, as well as any subsequent negotiations, usually needs to be pursued through the appropriate governmental authorities of the State in which the project is being undertaken.

17. In the case of developing countries in particular, such assistance is sometimes available through the specific aid programmes which certain governments have established to promote economic and social development in various areas of the world. These programmes extend assistance in the form of loans on preferential terms and the direct provision of supplies, equipment and technology. Examples of such sources of funds are presented in Appendix 2.

18. For projects not qualifying for aid from such sources, assistance in meeting the requirements for foreign financing is sometimes available through the special export-promoting agencies of certain governments. (These agencies are referred to in the context of aircraft financing in paragraph 11, Chapter IV.) Assistance from these sources takes various forms, including direct loans by the agency itself, guarantees covering private loans, and insurance of the risk assumed by national enterprises in providing goods and services on credit terms. Examples of such agencies are the Export Development Corporation of Canada, the Export-Import Banks of Japan and the United States, COFACE of France, HERMES of Germany and the Export Credits Guarantee Department of the United Kingdom.

### *Development banks and funds*

19. Probably the most important possible sources of foreign financing available to developing States are the international banks and funds established to assist in the financing and execution of projects seeking to promote national economic development. Such projects cover a wide range of economic activities, however, of which airports and route facilities are but two. Prominent among these banks and funds are the International Bank for Reconstruction and Development and its affiliates, the International Development Association and the International Finance Corporation, although the purpose of the latter is to promote development through loans to the private sector, and various regional development banks and funds. A list of such institutions is provided in Appendix 2.

20. As in the case of financing by foreign governments, the possibilities of obtaining financial assistance from the above institutions for any particular airport development project, and the procedures to be followed in applying for such assistance, inevitably involve the government of the State in which the project is being undertaken. There are two reasons for this: first, any loan or grant that is extended is made either to a government or government agency, or to a private entity with the support and guarantee of the government; second, the first test of suitability of a project is usually whether the sector of the economy in which it falls, and the project itself, are of high priority for development and are so recognized in the government's development plans.

### **Commercial sources**

21. A simple way of dealing with costs payable in foreign funds has in some instances been to place the responsibility for financing arrangements on foreign contractors and suppliers who stand to benefit directly from the airport or route facility project. In foreign commercial dealings it is often the practice for suppliers to be required to state, as part of their bid, the financing arrangements that they are prepared to offer, and for contractors to be given the responsibility for securing financing on the most favourable terms. In the financing of costs in such a manner, however, there is a risk that particularly needs to be guarded against, which is that in the process of selecting bids a firm's financing capability may be allowed to assume an importance disproportionate to that of other considerations more basic to the project's successful execution.

22. Banks, investment houses and other traditional commercial credit institutions operating in the private sector of the country of a contractor providing equipment, supplies or services for the airport project may, of course, be approached directly for financing assistance. The cost and other terms of credit obtained in this manner, however,



are in general likely to be more onerous than those obtainable from the various public sources described in the preceding paragraphs.

### **Bonds**

23. Bond issues have essentially not been used to finance airport projects except in the United States, where they have provided about two-thirds of airport financing needs with federal grants providing the balance. With the prospects of a growing number of airports moving towards partial or complete financial self-sufficiency, this form of financing may attract more interest in the future because the financial capacity of airports to directly or indirectly service bond issues may increase as a consequence. Of course, the terms under which a bond issue must be offered in order to be marketable, as well as the cost of the issue, will determine in each instance whether a bond issue is more advantageous than some other form of financing.

24. Bonds can be classified into the following two groups:

- a) general obligation bonds, which pledge the taxing power and full credit of the issuing government (State, provincial or municipal); and
- b) revenue bonds, which pledge the user charges, or concession and rental revenues generated by the actual facility to be operated.

25. Revenue bonds generally involve higher interest costs because they are not as well backed as general obligation bonds and because the receipts from user charges, fees and rentals are subject to greater uncertainty than are tax revenues. In the United States, revenue bonds are dominant at large- and medium-size airports, while general obligation bonds play an important but still minor role at small airports. Tax exemptions that might be offered — exemption from income taxes of a bond's purchase price and/or interest paid, for example — could be an important factor in determining the attractiveness of a bond issue to a potential investor.

### **Equity financing**

26. Reference was made above to privatization as one option in airport financing. Where an airport is organized and operated as a private company, the possibility of issuing shares for financing purposes could be considered. Given the financial situation of most airports and route facilities, however, this is only a viable option in a relatively small number of cases.

### **Private capital and "build, operate and transfer" (BOT) arrangements**

27. Although full privatization is not normally practicable, private capital has been used to finance part of the airport infrastructure. This refers, for example, to airline-owned or leased terminals, but a more recent development which could become more popular is the so-called build, operate and transfer (BOT) arrangements where an enterprise undertakes to construct and operate an airport facility, such as a passenger terminal, for a predetermined number of years following which ownership would revert to the airport. In agreeing to such an arrangement, the airport would also share in the profit from the facility's operation through a concession fee levied on the facility operator. An example of such an arrangement is Terminal Three at the Toronto International Airport in Canada.

***Leasing***

28. Leasing rather than outright purchase has in some cases provided an attractive alternative, for example where vehicles and machinery are involved. The benefit would be the use of the item leased without having to incur a substantial financial outlay. Also, the items can normally be used sooner than if financing were to be sought in order to purchase the items. Leasing, moreover, does not significantly influence the over-all amount of debt that needs to be served, and leasing arrangements may not be subject to the same extensive and time-consuming approval processes purchases frequently are.

29. On the negative side, with leasing the lessee does not enjoy the benefit of ownership, including the addition to total assets. This may be relevant when financing for other investment projects is being sought and assets that can be considered security are to be identified. Of greater significance is that leasing tends in the long run to be more expensive to the lessee because the overhead and profit of the lessor must be covered by the lease payments. In some circumstances, however, there may be offsetting factors: for example, where the items leased are renewed frequently, the maintenance expenses incurred by the lessee may be reduced. Tax laws in some States may also encourage leasing arrangements.

***Repayment of loans***

30. Where circumstances permit, growing emphasis is being placed on airports and route facility operators assuming responsibility for providing the funds required to meet part or all of the interest and instalment payments on loans taken to finance their infrastructure requirements. Their ability to do so depends to a large extent on their revenue-generating capacity, which may increase significantly as a result of the availability of the new or improved facilities financed by the loan(s) concerned. This applies particularly in the case of airports.

31. Funds required to service the debt obligations would need to be channelled from the over-all revenue flow. In the case of airports, these are principally revenues from charges on air traffic, concessions and rentals; in the case of route facilities these are essentially revenues from route facility charges. Repayment of foreign loans usually requires outlays in convertible currency, which can represent a problem in a number of States. In the case of route facility financing in particular, this has in some instances been overcome by setting aside a specific portion of route facility charges, denominated and paid in convertible currency, to meet such obligations.

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# Appendix 1

## GLOSSARY OF FINANCE TERMS

**Accelerated depreciation.** A rate of depreciation higher than the normal rate, generally for tax purposes.

**Asset-based financing.** A form of financing in which the risk is related to the value of the equipment.

**Balloon payment.** A payment which follows a series of lower periodic rentals paid over the term of the lease. Although normally paid at the end of the lease period, balloon payments may also occur during the lease term.

**Bond.** Documentary promise to repay long-term borrowed money with interest at a definite or determinable future date.

**Capital assets.** Assets acquired with the expectation that they will remain in service for a number of accounting periods.

**Capital costs.** Depreciation and interest on capital investment.

**Capital lease.** A lease which transfers substantially all the risks and benefits of ownership of the leased equipment to the lessee.

**Cross-border lease.** A lease in which the lessor and lessee are in different countries or different legal systems.

**Debentures.** An obligation not secured by a specific lien on property but issued upon the reputation, anticipated potential and general credit rating of the airport issuing the bond.

**Debt.** A form of financing where the borrower pays interest at an agreed rate and is liable to repay the principal by an agreed date.

**Debt/equity ratio.** A measure of the financial structure of a firm, which is used in the assessment of financial risk.

**Default.** An event defined in a lease agreement, such as failure to pay rent or perform some obligation required under the terms of a lease.

**Defeasance.** A situation where the lessee borrows at one rate and deposits at a higher rate, with the deposit used to fulfil the rental obligations in the lease. Since the deposit is at a higher rate, the sum deposited is less than the total borrowed-financed amount and the lessee obtains an up-front cash benefit which can be used to increase the net present value benefit of the transaction.

**Dole-Pickle bill.** United States legislation by which cross-border leasing was effectively abolished for that country.

**Double-dip lease.** A lease that takes advantage of tax and funding incentives from two sources, usually situated in two different countries.

**Equity.** A form of financing which provides a share in the ownership of an entity and on which dividends are paid out of the profits earned by the entity concerned.

**Equity participation.** Where the lessor or one of the group of lessors participates in a leveraged lease. Equity participants hold trust certificates to provide evidence of their beneficial interest as owners under the owner trust.

**Export credit.** A financial arrangement for funding the purchase of equipment by foreign buyers with repayments by the buyers on agreed terms and conditions.

**Financial lease.** A lease where ownership, and the associated benefits and risks, are transferred to the lessee at the end of the lease period. Rentals are net to the lessor. Taxes, insurance, maintenance are the responsibility of the lessor. Rentals over the life of the lease are sufficient to cover the cost of the equipment plus a return on investment.

**First loss deficiency guarantee.** A guarantee given by the manufacturer on the continued value of the product.

**Institutional investors.** Investors such as banks, insurance companies, trust funds, pension funds, foundations, educational institutions, etc.

**Japanese leveraged lease.** A type of lease originated in Japan in 1986 by which cross-border leasing of commercial aircraft is financed through Japanese funds (equity is provided by a blind pool of investors and non-recourse debt is provided by Japanese financial institutions).

**LASU (Large Aircraft Sector Understanding).** An agreement negotiated through OECD by the countries of the European Community and the United States in 1985, covering export sales of aircraft and helicopters, and ruling cash down payments, credit terms and fixation of interest rates.

**Lease.** A contract between a lessor and lessee for the hire of equipment. The ownership of the asset is retained by the lessor, but the right to use it is given to the lessee for an agreed period of time in return for a series of rentals paid by the lessee to the lessor.

**Lessee.** The user of the equipment which is being leased.

**Lessor.** The owner of the equipment which is being leased.

**Leveraged buyout (LBO).** A selling transaction secured by the assets of the buyer.

**Operating lease.** A lease where the lessor retains ownership, and the associated risks and property

advantages, of the asset at the end of the lease period, which may be quite short.

**Repossession.** The act of recovering the leased asset from the company and country where it is leased.

**Repossession insurance.** Insurance against the inability to recover leased equipment in the event of a default (for example, non-return of an aircraft by a foreign government or inability of the lender to deregister the aircraft).

**Residual value of an asset.** Cost of an asset less any part of the cost that has been depreciated or amortized or treated as an expense or loss. (Also, the value of the leased equipment at the conclusion of the lease term.)

**Sale-leaseback.** A transaction which involves the sale of equipment by the owner and the subsequent lease of the same equipment back to the seller.

**Samurai lease.** Japanese-sourced lease designed to fund foreign assets in order to help to reduce the Japanese balance of payments surplus.

**Short-term lease.** Generally refers to an operating lease.

**Sub-lease.** A transaction in which the leased equipment is re-leased by the original lessee to a third party, while the lease agreement between the two original parties remains in effect.

**Useful life.** The period of time during which an asset will have economic value and be usable. Useful life is sometimes called the economic life of the asset.

**Walkaway lease.** A lease which allows the possibility for the lessee to return equipment to the manufacturer providing a short notice is given, without having to make penalty payments.

**Wet lease.** The lease of an aircraft with crew and other back-up.

**Dry lease.** The lease of an aircraft without the crew.

## Appendix 2

# INSTITUTIONS INVOLVED IN FINANCING AIRCRAFT AND/OR AIRPORT AND ROUTE FACILITY INFRASTRUCTURE

(Note.— This list is representative rather than exhaustive. Also, some of the institutions are involved in the financing of feasibility studies and investment analyses, in the provision of experts, or acting as executing agencies — for example, ICAO — rather than in providing direct financing.)

### INTERNATIONAL ORGANIZATIONS AND DEVELOPMENT BANKS

Abu Dhabi Fund for Arab Economic Development —  
Abu Dhabi, United Arab Emirates

African Development Bank — Abidjan, Côte d'Ivoire

Arab Bank for Economic Development in Africa  
(ABEDA) — Khartoum, Sudan

Arab Fund for Economic and Social Development —  
Kuwait

Asian Development Bank — Manila, Philippines

Caribbean Development Bank — Bridgetown,  
Barbados

European Development Fund, Commission of the  
European Communities — Brussels, Belgium

European Fund for Regional Development —  
Brussels, Belgium

European Investment Bank (EIB) — Luxembourg

Inter-American Development Bank — Washington,  
D.C., United States

International Bank for Reconstruction and  
Development (World Bank) — Washington, D.C.,  
United States

International Civil Aviation Organization (ICAO) —  
Montreal, Canada

Islamic Development Bank (IDB) — Jeddah, Saudi  
Arabia

Kuwait Fund for Arab Economic Development —  
Kuwait

Multilateral Investment Guarantee Agency (MIGA) —  
Washington, D.C., United States

Organization of Petroleum Exporting Countries  
(OPEC) Fund for International Development —  
Vienna, Austria

Saudi Fund for Development — Riyadh, Saudi Arabia

United Nations Development Programme (UNDP) —  
New York, United States

### STATE-OPERATED AID PROGRAMMES

*Belgium:* Administration générale de la Coopération  
au Développement

*Canada:* Canadian International Development Agency  
(CIDA)

*Denmark:* Danish International Development Agency  
(DANIDA)

*France:* Caisse Centrale de Coopération Économique (CCCE)

*Germany:* Ministry of Economic Co-operation, Kreditanstalt für Wiederaufbau (KfW); Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)

*Italy:* Department of Co-operation

*Japan:* Overseas Economic Co-operation Fund

*Netherlands, Kingdom of the:* Foreign Ministry

*Norway:* Norwegian Agency for International Development (NORAD)

*Russian Federation:* Ministry of External Economic Relations

*Spain:* Cooperación Internacional

*Sweden:* Swedish International Development Authority (SIDA)

*United Kingdom:* Overseas Development Administration (ODA)

*United States:* United States Agency for International Development (USAID)

#### **EXPORT CREDIT AGENCIES**

*Canada:* Export Development Corporation

*France:* Compagnie Française d'Assurance pour le Commerce Extérieur (COFACE)

*Germany:* HERMES

*Japan:* Export/Import Bank

*United Kingdom:* Export Credits Guarantee Department (ECGD)

*United States:* The Export/Import Bank (EXIMBANK); Foreign Sales Corporation (FSC)

#### **AIRCRAFT OPERATING LEASE COMPANIES**

**Major leasing companies**  
(together accounting for three-quarters  
of aircraft leasing)

Ansett World-Wide Aviation Services (AWAS) —  
Sydney, Australia

Guinness Peat Aviation (GPA) — Shannon, Ireland

International Lease Finance Corporation (ILFC) —  
Los Angeles, United States

#### **Other leasing companies**

Avmark — United States

Electra — United States

GATX — United States, in a joint venture with  
Crédit Lyonnais — France

General Electric (Credit) Corporation (and its  
subsidiary, Polaris, dealing mainly in financial leases  
but also in operating leases) — United States

Partnairs — France

### Appendix 3

## PRIMARY SOURCES FOR FINANCING MAJOR AIRPORTS AND ROUTE FACILITIES (1989)

State	Airports								Route facilities						
	Self-financing	National government	Regional/municipal government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other	Self-financing	National government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other
						Dom.	For.						Dom.	For.	
Algeria		x													
Angola				x	x					x	x				
Argentina	x								x						
Australia	x					x									
Bangladesh	x	x		x					x	x	x				
Barbados		x								x					
Benin	x				x				x		x	x			
Bolivia		x	x	x	x					x	x	x			
Botswana		x								x					
Brazil	x	x		x			x		x	x	x			x	
Bulgaria										x					
Canada	x	x	x					x <sup>1</sup>	x	x					
Chile		x							x						
China	x	x	x	x		x			x	x	x		x		
Colombia	x	x	x	x	x	x	x		x		x		x	x	
Costa Rica	x	x		x					x	x		x			
Côte d'Ivoire		x								x					
Cyprus		x								x					
Czechoslovakia	x	x			x					x					

State	Airports								Route facilities						
	Self-financing	National government	Regional/municipal government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other	Self-financing	National government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other
						Dom.	For.						Dom.	For.	
Denmark	x					x				x					
Ethiopia		x		x	x					x	x	x			
Fiji	x			x		x	x		x		x		x	x	
Finland	x <sup>2</sup>					x	x		x <sup>2</sup>				x	x	
France	x <sup>3</sup>		x <sup>3</sup>			x <sup>3</sup>				x					
Germany	x					x				x					
Ghana	x	x		x	x	x	x		x	x	x	x	x	x	
Greece		x								x					
Grenada		x								x					
Hungary	x	x							x	x					
Iceland		x								x					
Indonesia				x							x				
Ireland										x					
Italy		x								x					
Japan	x	x				x				x					
Kenya		x		x			x			x	x				
Malawi		x		x						x	x				
Malaysia	x	x			x				x	x					
Mexico	x		x							x					
Monaco		x													
Myanmar		x						x <sup>4</sup>		x					x <sup>4</sup>
Netherlands, Kingdom of the	x	x <sup>5</sup>				x			x	x			x		

State	Airports								Route facilities						
	Self-financing	National government	Regional/municipal government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other	Self-financing	National government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other
						Dom.	For.						Dom.	For.	
New Zealand - Auckland - Christchurch	X X							X					X	X	
Nigeria		X							X	X					
Norway	X	X							X	X					
Pakistan	X			X					X		X				
Peru	X		X	X	X				X		X	X			
Poland	X	X					X		X					X	
Portugal	X				X			X <sup>B</sup>	X			X			
Russian Federation		X		X						X					
Rwanda	X								X	X	X	X	X	X	
Seychelles		X		X						X	X	X			
Singapore	X								X						
Solomon Islands	X			X					X	X					
Spain		X								X					
Sri Lanka	X							X <sup>7</sup>	X	X					
Sudan	X	X	X	X						X	X				
Sweden	X					X			X				X		
Switzerland - Zurich - Geneva - Basel	X <sup>B</sup> X		X <sup>9</sup> X		X				X						
Syrian Arab Republic		X		X	X	X	X			X					
Thailand	X								X						



State	Airports								Route facilities						
	Self-financing	National government	Regional/municipal government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other	Self-financing	National government	Foreign government loans or aid	International development banks or funds	Commercial Loans		Other
						Dom.	For.						Dom.	For.	
Togo				X							X				
Tunisia	X	X						X <sup>10</sup>	X	X					
United Arab Emirates		X								X					
United Kingdom - BAA airports - Manchester - Hong Kong	X X				X	X	X	X <sup>11</sup>	X X	X X					
United Republic of Tanzania		X		X	X					X	X	X			
United States	X	X	X			X				X					
Zaire	X	X			X				X	X		X			
Zambia	X			X					X		X				
Zimbabwe		X		X							X				

## Notes:

- 1) Private sector developer — capital leasebacks.
- 2) Within CAA framework.
- 3) Depending on the airport, the main source of financing is one of these three sources.
- 4) United Nations Development Programme/ICAO.
- 5) For airport approach navigation services.
- 6) European Economic Committee subsidies and National Banks.

- 7) Retained recovery of the government.
- 8) Applies to 1989/1990.
- 9) Large investments were provided by the Cantonal government in years other than 1989/1990.
- 10) Initial financing provided by the government.
- 11) Retained earnings and government-approved borrowing.

Source: 1991 Conference on Airport and Route Facility Management - Working Paper 15.

## ICAO PUBLICATIONS IN THE AIR TRANSPORT FIELD

The following summary gives the status and also describes in general terms the contents of the various series of publications in the air transport field issued by the International Civil Aviation Organization:

**International Standards and Recommended Practices on Facilitation** (*designated as Annex 9 to the Convention*) which are adopted by the Council in accordance with Articles 37, 54 and 90 of the Convention on International Civil Aviation. The uniform observance of the specifications contained in the International Standards on Facilitation is recognized as practicable and as necessary to facilitate and improve some aspect of international air navigation, while the observance of any specification contained in the Recommended Practices is recognized as generally practicable and as highly desirable to facilitate and improve some aspect of international air navigation. Any differences between the national regulations and practices of a State and those established by an International Standard must be notified to the Council in accordance with Article 38 of the Convention. The Council has also invited Contracting States to notify differences from the provisions of the Recommended Practices;

**Council Statements** on policy relating to air transport questions, such as the economics of airports and en-route air navigation facilities, taxation and aims in the field of facilitation;

**Digests of Statistics** which are issued on a regular basis, presenting the statistical information received from Contracting States on their civil aviation activities;

**Circulars** providing specialized information of interest to Contracting States. They include regional studies on the development of international air passenger, freight and mail traffic and specialized studies of a world-wide nature;

**Manuals** providing information or guidance to Contracting States on such questions as airport and air navigation facility tariffs, air traffic forecasting techniques and air transport statistics.

Also of interest to Contracting States are reports of meetings in the air transport field, such as sessions of the Facilitation Division and the Statistics Division and conferences on the economics of airports and air navigation facilities. Supplements to these reports are issued, indicating the action taken by the Council on the meeting recommendations, many of which are addressed to Contracting States.

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