THE ECONOMIC BENEFITS OF AIR TRANSPORT

2000 EDITION

ATAG

The Air Transport Action Group (ATAG) is a coalition of organisations from throughout the air transport industry, formed to press for economically beneficial aviation capacity improvements in an environmentally responsible manner. ATAG is a leading proponent of aviation infrastructure development, advocating the economic benefits of air transport, the industry's excellent environmental performance and the need for major improvements in airport surface access and air traffic management capacity.

ATAG's world-wide membership includes airlines, airports, manufacturers, air traffic control authorities, airline pilot and air traffic controller unions, chambers of commerce, tourism and travel associations, investment organisations, ground transport and communications providers.

To achieve its objectives, ATAG:

- provides support for the expansion of air traffic management capabilities to meet future industry needs;
- assists in the development of airport capacity to meet growing demand;
- supports the development of improved ground access to airports.

Recognising that these goals can only be obtained in an environmentally responsible manner, ATAG:

- emphasises the air transport industry's progress in minimising environmental impact;
- promotes the environmentally responsible growth and development of air transport.

January 2000

AIR TRANSPORT ACTION GROUP

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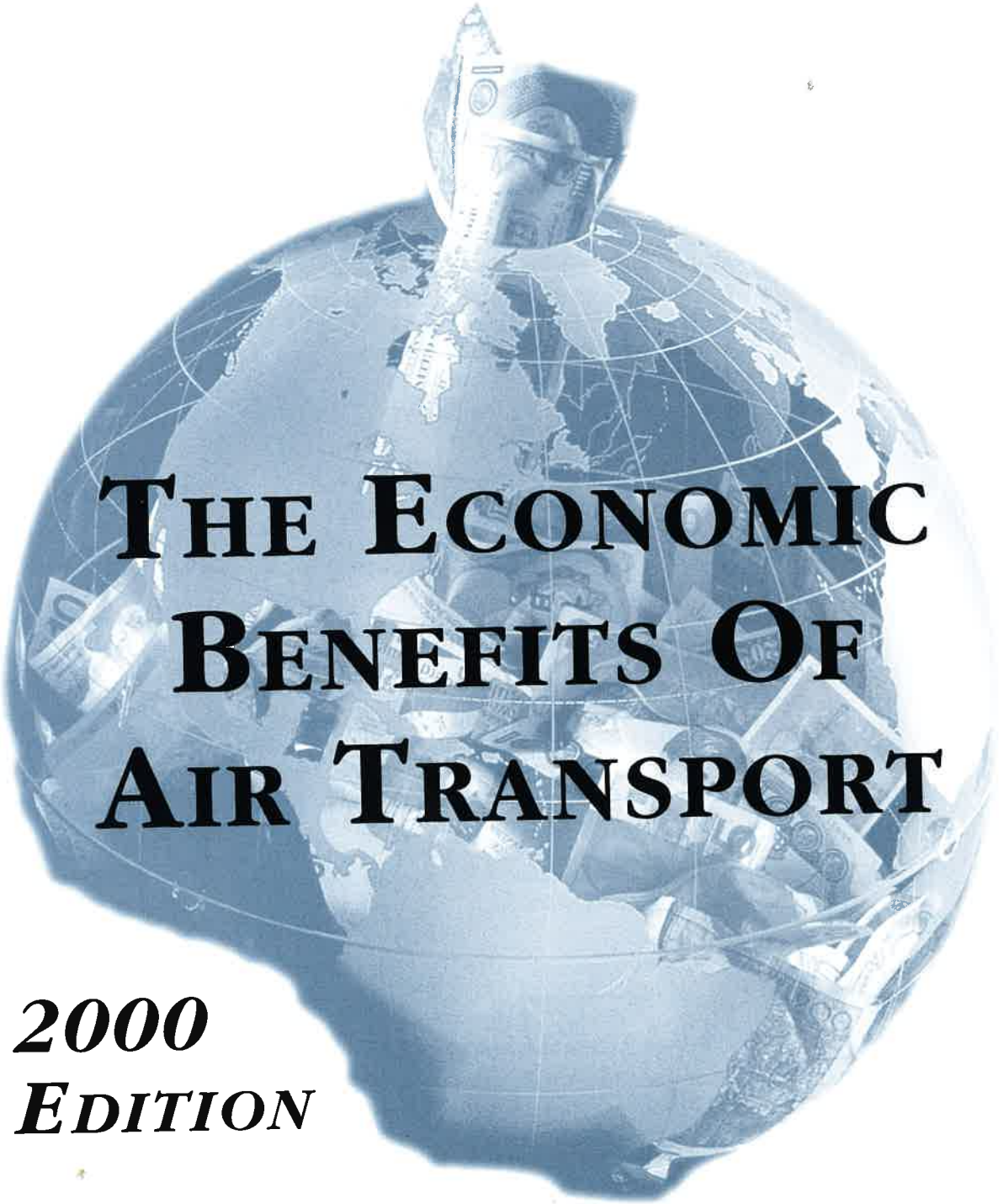
This edition of The Economic Benefits of Air Transport is the third update of an original report prepared for ATAG by the International Air Transport Association (IATA) in 1991 on the role of aviation in the international economy. It draws on research undertaken by a number of consultants and other specialists world-wide. Since their assumptions and methodologies vary widely - and this can alter the conclusions significantly - the estimates of the benefits that are made here are consistently conservative.



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Contents

SUMMARY

A MAJOR WORLDWIDE BUSINESS

The air transport industry plays a major role in world economic activity.

- Over 1,600 million passengers per year rely on the world's airlines for business and vacation travel.
- Around 40% of the world's manufactured exports, by value, are transported by air.

Over 1,600 million passengers per year

AN ECONOMIC CATALYST

In every region of the world, countries large and small depend on the aviation industry to stimulate their economic growth and their financial strength. In 1998 the industry provided at least:

28 million jobs for the world's workforce

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US$1,360 billion in annual gross output

- US$1,360 billion in annual gross output.

Air transport drives economic progress and in turn benefits from it. Air transport acts as an economic catalyst, promoting leisure and business activities, contributing to growth and increasing efficiency.

A third of the world's manufactured exports (by value) are transported by air

A GROWTH INDUSTRY

Air transport remains one of the fastest growing sectors of the world economy.

- Passenger and freight traffic are expected to increase at an average annual rate of around 4-5% between 1998 and 2010, significantly greater than the growth of global GDP.
- By 2010 the number of people travelling by air could exceed 2.3 billion each year.

In an increasingly global society, the contribution of the industry to the world's economies continues to grow day by day.

- By the year 2010 aviation's economic impact could exceed US$1,800 billion, with over 31 million jobs provided.

A Need for Investment

Congestion is a serious and increasing constraint on the growth of air transport, and inadequate aviation infrastructure costs the world economy billions of dollars in inefficiency.

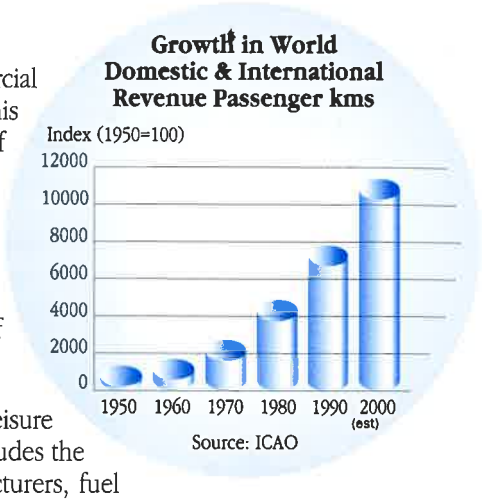
Air transport remains one of the fastest growing sectors of the world economy

- A 1995 study for the European Civil Aviation Conference (ECAC) showed that the improvement potential in ATM efficiency alone could be as much as ECU2.5 billion per year or about 5% of total airline costs. Preliminary calculations by the European Union and the EUROCONTROL Performance Review Commission suggest that the cost to airlines and passengers of air traffic delays in Europe is now between ECU5.4-5.7 billion. In the US, a 1999 study by the Air Transport Association of America (ATA) indicates that air traffic control delays in 1998 were estimated to have cost US airlines and their passengers more than US$4.5 billion. Similar sums will be lost in the Asia/Pacific region without concerted aviation infrastructure planning.

By the year 2010 aviation's economic impact could exceed US$1,800 billion with over 33 million jobs provided

Future economic growth will be jeopardised unless governments and other authorities invest substantially in the infrastructure necessary to support the air transport industry. Air transport is an essential service - measures must be taken to ensure its healthy growth.

Air transport is one of the world's most important services. Its development and its technical and service achievements place air transport as one of the greatest contributors to the advancement of modern society.

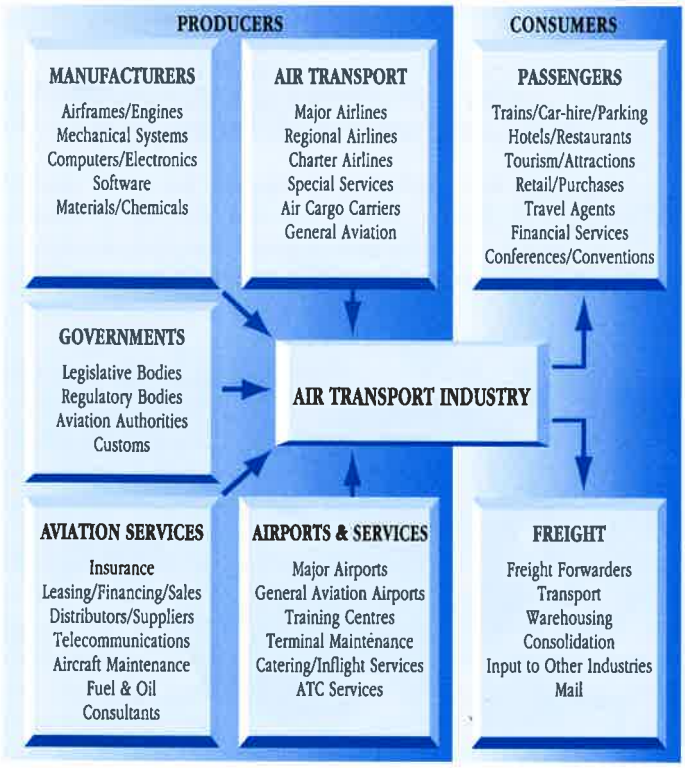


Since the first jet airliner flew in 1949, use of commercial aviation has grown more than seventy-fold. This growth is unmatched by any other major form of transport.

Air transport is essential to economic progress. In an increasingly global community and marketplace, air transport makes possible the rapid movement of millions of people and billions of dollars worth of goods to markets around the world.

The industry plays a decisive role in the work and leisure of hundreds of millions of people. The industry includes the suppliers and operators of aircraft, engine manufacturers, fuel suppliers, airports and air traffic control systems. Its customers come from every sector of the world's economy and from every segment of the world's population.

The Air Transport Industry Today



The Size Of The Industry

By any measure air transport is a major economic force and a source of enormous wealth:

- More than 1,600 million passengers were carried by the world's airlines in 1998.

1,600 million passengers

US$260 billion in annual turnover

- Over 29 million tonnes of freight were transported by air in 1998, representing approximately 40%, by value, of the world's manufactured exports.

29 million tonnes of freight

- North American airlines fly about 40% of the world's total passenger traffic, whilst European carriers account for 26%, and carriers in the Asia/Pacific region 24%.
- An annual turnover of US$307 billion was generated by airlines in 1998, a figure higher than the GNP of many national economies.

3.9 million people directly employed

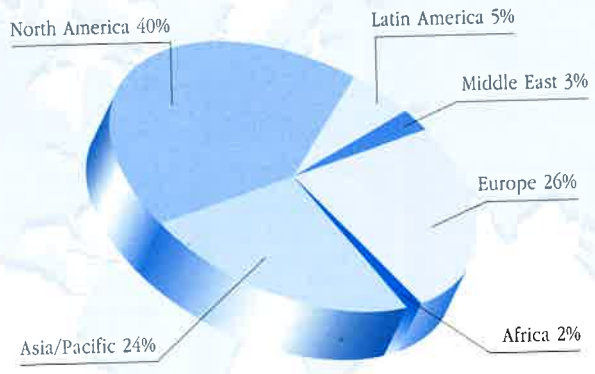
- More than 3.9 million people are directly employed by the industry throughout the world. Nearly 1.5 million people in the US alone work in the air transport sector.

18,000 aircraft
10,000 airports

- The world's airlines have a total fleet of about 18,000 aircraft operating over a route network of approximately 15 million kilometres and serving nearly 10,000 airports.
- Air transport provides the foundation for international tourism, with over half of all international tourists, apart from those travelling within Europe, travelling by air.

Over half of all international tourists outside Europe travel by air

1998 Passenger Kilometres by World Region

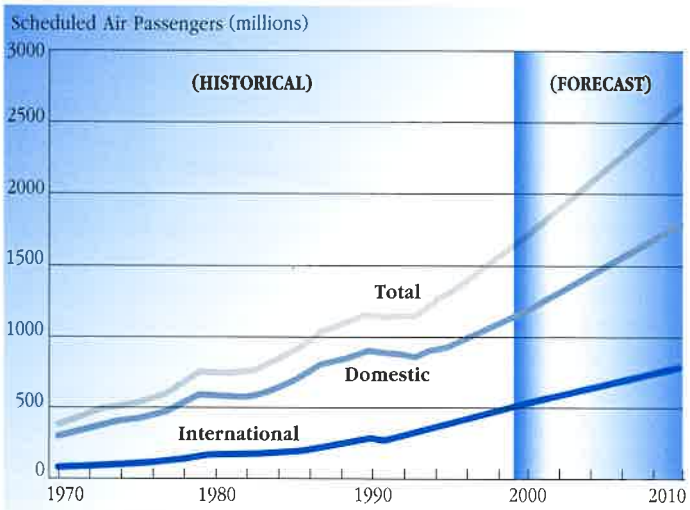


Source: ICAO

Economic Drivers Of Growth In Air Transport

The demand for air transport has increased steadily over the years. During the 1980's, and for most of the 1990's, passenger traffic grew on average by 6% per annum. Industry sources now expect world-wide passenger demand to grow at a slower rate than this in the future, as shown in the diagram below.

Growth in Scheduled Air Passenger Services World-wide



Source: ICAO, IATA

A list of some of the major elements which have influenced this past growth are shown below.

If these factors are analysed quantitatively, it is possible to identify two key drivers – GDP growth and real price (fares) reductions by airlines. While these elements alone may not accurately predict aviation traffic changes at the country level, they do however represent aviation trends at the world level.
As the diagram indicates, air traffic growth has historically been about twice the rate of GDP growth and has also been influenced by the downward trend in real fares.

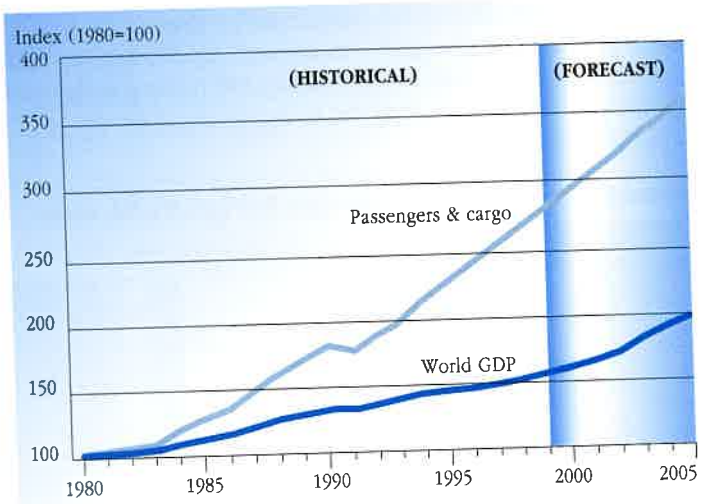
Over the past four decades there appears to have been a change in the balance of importance between GDP and real price factors. During the period 1960-1990 some 80% of traffic growth was explained by GDP growth, with 20% due to price reduction, in the 1990's this appears to be nearer 60% and 40% respectively. Price reduction has become more important in the 1990s as average world GDP growth rates have softened.

AIR TRAFFIC GROWTH

Factors Driving World Air Traffic Growth

- *Falling real cost of air travel*
- *Increasing economic activity*
- *Intensifying international trade*
- *Increasing disposable incomes*
- *Political stability/instability*
- *Relaxation of travel restrictions*
- *Ethnic ties expanding*
- *Increasing leisure time*
- *Tourism promotion*
- *Air transport liberalisation*
- *Emerging regions and countries with low base traffic growth*

Growth in Passengers & Cargo versus World Economic Growth

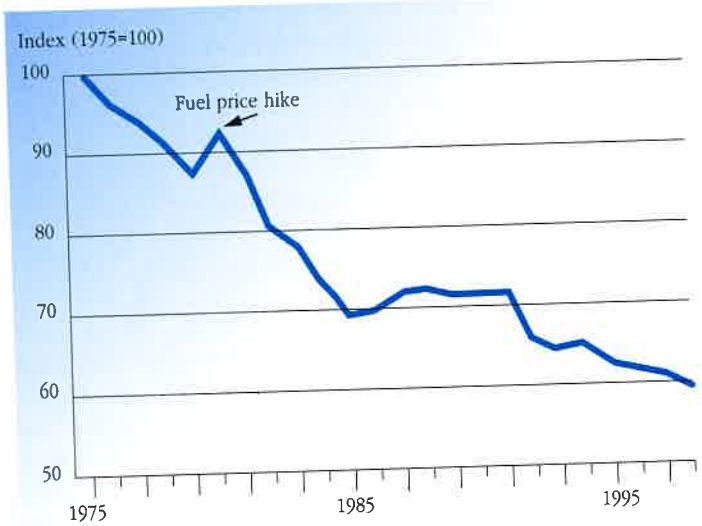


Passengers & cargo (World Revenue Tonne Kms)

Source: ICAO

Analysis of airline cost and revenue information over the past decade reveals that in many areas, such as fuel purchasing, airlines have been able to achieve substantial reductions in their cost levels. These reductions have translated into cheaper fares helping to stimulate demand for air travel. Should such sources of cost reductions 'dry up' then airlines will be forced to raise real air fares, thus restricting future traffic growth. A particular cost element of concern is that of en-route charges and airport

World Air Fare Trends - in Real Terms



Source: Boeing

facilities, which appear to have risen, as a proportion of total international airline operating costs, by 20% over the period 1991-1998. Although the historic trend in real air fares has been downward, the long term continuation of this curve cannot be guaranteed.

In addition to achieving cost reductions, the airline industry has also been extremely successful in realising major step gains in productivity through the introduction of new technology, such as the move from narrow bodied to wide bodied aircraft. Recent airline data suggests that the scope for further productivity increases of this type may be limited.

All in all, the message is that the wide economic benefits of air transport have been driven for three decades by GDP growth and airline productivity gains. In the case of GDP, lower growth rates are now predicted for the immediate future, and the gearing of aviation growth to GDP in some countries may be increasingly affected by the maturity of markets. In the case of the spectacular reductions in costs and prices achieved by airlines for the benefit of customers, such reductions cannot be taken for granted in the future. For certain outside cost elements (e.g. fuel, user charges) trends appear inflationary for the immediate future, and airline productivity gains will be increasingly more difficult to achieve.

METHODOLOGY

The economic benefits of air transport were assessed by looking at the full extent of the industry's impact on the global economy, from the actual movement of passengers and cargo to the stimulation of economic growth that the industry's presence can cause in a local situation. These are defined as direct, indirect, and induced impacts.

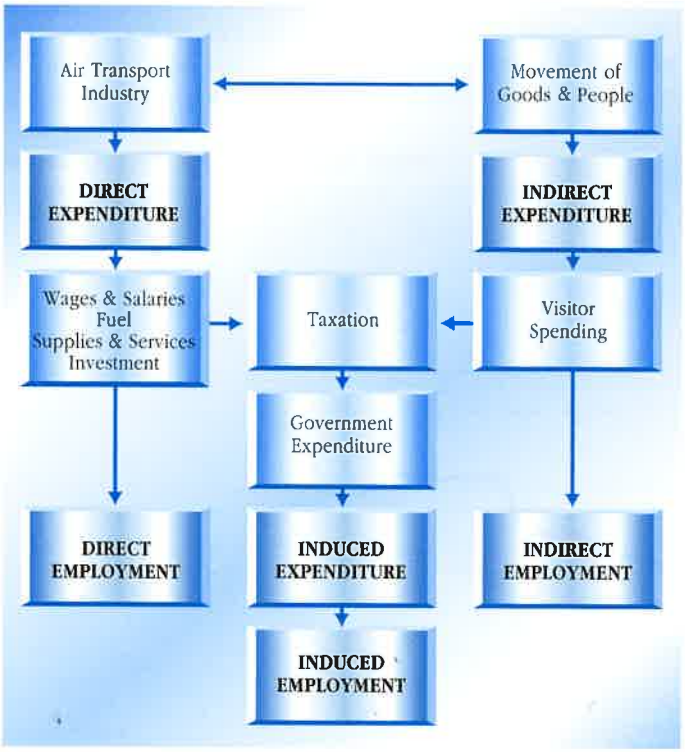
The direct economic impact

The indirect economic impact

The induced impact

The direct economic impact is obtained by measuring the values of the activities of airlines, airports and businesses located at airports, including everything from fuel suppliers to hot-dog stands. *The indirect economic impact* is derived from the off-airport activities of passengers and shippers, such as expenditures at travel agencies, hotels and restaurants, and tourist attractions. *The induced impact* is calculated with the help of a multiplier which estimates the successive rounds of spending generated by the recipients of the direct and indirect economic benefits. For example, airline employees spend part of their salaries on new cars, which leads car dealer employees to spend part of their salaries on groceries and so on. Values for the multiplier have ranged from 0.4 to 2.4. Values at the lower end of this range are used throughout this study to ensure that all claims of benefits are conservatively estimated.

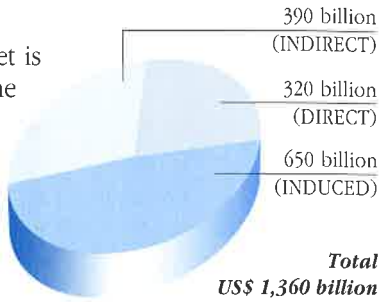
Components of Total Economic Impact



Aviation Generates Wealth

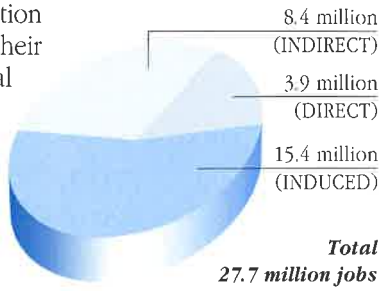
The total economic impact of aviation on gross world output amounted to at least US$1,360 billion in 1998. This figure comprised US$320 billion in direct impact, US$390 billion in indirect impact, and US$650 billion in induced impact.

Air Transport's Impact on World Economic Activity & Employment 1998



Aviation Generates Employment

The total economic impact of aviation on the labour market is estimated at nearly *28 million jobs*. This total includes the direct employment of nearly 4 million people in the industry, over 8 million people who are employed indirectly by the industry - 2/3 of them in Europe and North America alone - and an induced impact conservatively estimated at more than 15 million people.



Aviation Generates Taxes

The air transport industry pays substantial amounts of taxation to local, provincial and national governments around the world. Passengers and shippers pay taxes on their air transportation tickets, whilst aviation employees pay income taxes on their salaries. In the United States alone, for example, the annual federal user taxes and fees paid by airlines are now estimated at more than US$9.2 billion, of which almost three quarters are in the form of passenger ticket taxes. In addition, airline employees in the US paid over US$2.2 billion in payroll taxes alone.

Aviation Generates Travel and Tourism

Aviation is at the heart of the travel and tourism industry, now the world's largest industry. By 1999, travel and tourism supported approximately *192 million jobs*, or 1 out of every 12 workers in the world. According to figures compiled by the World Travel and Tourism Council for 1999, the travel and tourism sector, with around 625 million customers each year, is expected to generate an annual gross output of roughly *US$3,550 billion*, about 12% of the world's total GDP. By 2010, the level of travel and tourism employment is forecast to rise to over 250 million jobs, with an expected annual gross output of around US$6,800 billion.

Wider «Spin-Off» Benefits

Above and beyond all of these quantifiable economic benefits, commercial aviation also generates a whole host of less tangible «spin-off» benefits. These include reducing the cost of trade and movement, attracting new businesses to locations with good air service links to the rest of the world, and support for the development of new technology and distribution processes based on the rapid movement of people and goods.

In addition, there are equally significant fringe benefits, including:

- the strengthening of ethnic and cultural links between countries and continents.
- the stimulation of innovative research and development which benefits the whole economy.
- a significant contribution to rapid relief of natural disasters and other emergencies.

Regional Economic Benefits

Airports act as magnets to a wide range of industrial and commercial enterprises. Many industries locate close to airports specifically to gain easy access to air transport and the ground-based infrastructure, such as road and rail links, created to serve them.

- For example, at Manchester in the United Kingdom, a large number of overseas companies have confirmed that the excellent freight and passenger transport services provided by the airport, were the most important factors in their decision to relocate to, or remain, near the airport.
- An economic impact study carried out for Vancouver International Airport in 1997 suggests that tourism services and facilities, such as the Whistler/Blackcomb ski resort, in the Vancouver area would be much smaller without direct air services to Japan and Europe. In addition, without competitive non-stop air services to Pacific Rim countries, British Columbia's high technology companies and consulting firms could not service international customers as well as they can with the existing flight schedules. The introduction of new air services, facilitated by the USA-Canada Open Skies agreement, has resulted in further expansion of British Columbia's conference and convention business.

Airports are key assets for regions wishing to attract new industries. Their presence offers a strong inducement for companies wishing to set up in a particular location. A region cannot be marketed as a centre for establishing major new businesses without an efficient air transport infrastructure, nor will it attract major investment.

Many studies have examined the specific impact of airport activity on the local economy. Whilst the conclusions have varied widely, the range of potential economic benefits would appear to be as indicated in the adjacent chart.

Typical Economic Impacts of Airports

Per 1 million Passengers

Estimate	Jobs		Economic Impact (US$ Millions)	
	"Direct"	Total	"Direct"	Total
High	2,000	8,000	225	1600
Medium	1,500	6,000	75	650
Low	750	2,500	35	130

The High, Medium and Low estimates reflect the mix of international/national traffic, the assessment method used, consideration of regional versus national effects, and the importance of hubbing.

SUMMARY: AIR TRANSPORT AS AN ECONOMIC CATALYST

In addition to the quantitative and qualitative contributions of the air transport industry, aviation also acts as *an economic catalyst* by:

- providing a new and faster *mechanism for distributing goods and services* throughout the world.
- contributing to *growth in existing industries.*
- increasing overall *economic efficiency.*

Air transport *reduces the cost of trade and opens up new market opportunities* by moving products and services quickly over long distances.

- The availability of air transport has created entirely new industries, such as the export of fresh tropical fruit from Latin America and the Caribbean to Europe.
- Air transport has generated an enormous increase in tourism to remote and developing regions. For example, in Asia countries such as Thailand, and more recently Vietnam, have benefited from significant growth in tourist derived income.

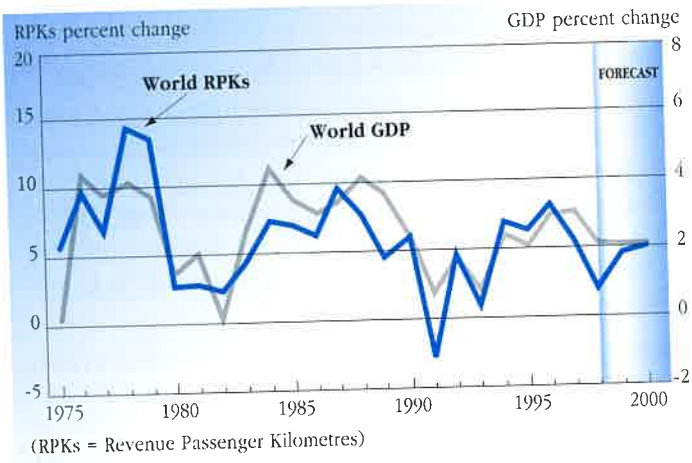
Economic efficiency is increased by the ability of airlines to deliver stock, equipment and personnel anywhere in the world within 24 hours.

- *Just-in-time manufacturing practices* would be unthinkable without air transport, particularly for companies which incorporate foreign-sourced components and materials in their products.
- Companies operating significant regional sales and after-sales service and support functions would be severely constrained without ready access to air transport.
- International business opportunities are enhanced by facilitating *personal contact* with dispersed operations and long distance markets.
- The development of electronic communication means, including the Internet, as a base for world-wide electronic commerce relies heavily on complementary delivery services of *high reliability and speed,* such as those provided by express air freight companies.

All the available evidence suggests a close historic synergy between economic growth and airline activity. Growth in air transport drives economic progress and in turn benefits from it.

As world economic growth has accelerated and slowed since 1975, the air transport sector has reflected these changes (see chart), thus confirming the link between airline activity and global prosperity.

World Air Travel Growth Versus World Economic Growth



(RPKs = Revenue Passenger Kilometres)

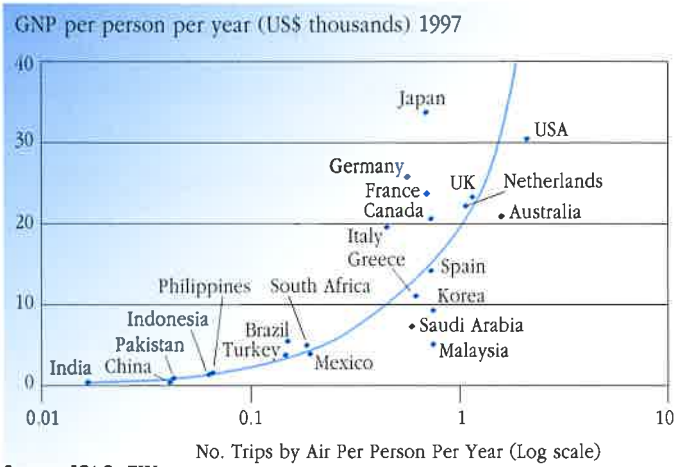
Source: ICAO,OECD

Air transport's importance as a catalyst for economic growth has been demonstrated by the effects of the 1995 US-Canada "Open Skies" agreement. The bilateral agreement sparked traffic growth of a million passengers in the first year of its implementation.

This agreement lowered fares, expanded air services, stimulated employment and enhanced economic growth in the two countries. Some US cities estimated, during preparations for negotiations, that such an agreement would stimulate more than US$15 billion in new economic activity between the two countries and create thousands of new jobs in the process.

The impact of economic prosperity on air transport activity is shown in the following chart which compares per capita GNP by country with demand for air travel.

Economic Growth and Air Transport Activity



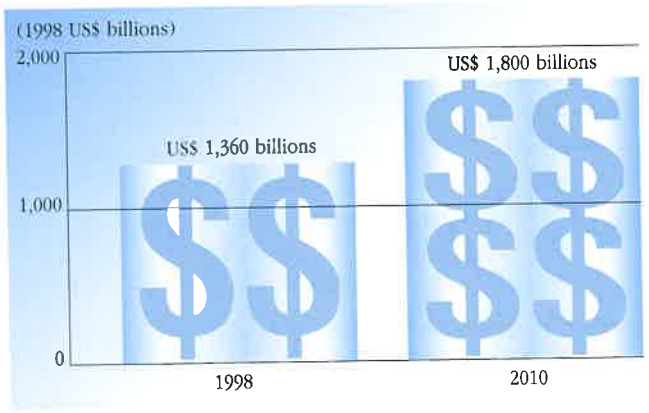
Source: ICAO, EIU

Countries with developed economies exhibit higher levels of air transport activity. In these countries, the relatively higher disposable per capita incomes increase the propensity of people to spend on air travel. An increase in airline activity can therefore provide a useful indicator of the progress of a nation's economy.

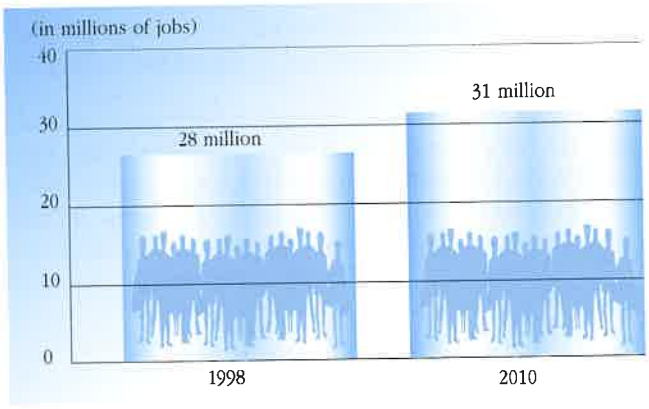
THE FUTURE

Provided that current and forecast congestion problems are tackled, air transport is expected to remain one of the fastest growing sectors of the world economy. As the industry grows, so will its impact on the world economy. Aviation's measurable economic impact could reach more than US$1,800 billion by the year 2010, whilst the number of jobs created by the industry may increase to more than 31 million.

Aviation's Projected Impact on World Economic Activity 1998 - 2010



Aviation's Projected Impact on World Employment 1998 - 2010



Some specific examples help to illustrate the economic benefits of air transport, and are also useful in highlighting the costs associated with congestion and under-investment in aviation infrastructure.

ASIA-PACIFIC

BRISBANE INTERNATIONAL AIRPORT, AUSTRALIA

IMPORTANCE TO LOCAL ECONOMY

Brisbane Airport is an important part of the Australia TradeCoast area, as well as being a key element of the air transport network in the Australasia region. The value of visitor arrivals and freight exports and imports through the airport to the South East Queensland economy is of major economic significance to the region.

This importance is reflected by the impact of Brisbane Airport on the Queensland economy. An economic impact study carried out in 1998 by Ernst & Young for Brisbane Airport shows that in 1996/97, the airport accounted for approximately 6.8% of Gross State Product, and for 5.2% of employment in the State. As a result, 16,400 people earned their living directly from airport operations, and a further 67,200 jobs were indirectly dependent on airport operations.

The economic importance of Brisbane Airport is expected to increase even more in the future as airport growth continues. By 2018, it is estimated that 42,000 people will earn their living directly from airport operations, with a further 200,000 jobs indirectly dependent on airport operations.

- Total annual passenger movements at Brisbane Airport grew from 2.6 million in 1977/78 to 10.6 million in 1996/97 and could reach 33 million by 2018.
- An increase in the amount of total air freight (international and domestic) from 122,000 tonnes in 1996/97 to 400,000 tonnes is forecast by 2018.
- By 2018, the number of scheduled passenger aircraft movements is forecast to grow from 131,000 per year in 1996/97 to 329,000 per year.
- An increase in total expenditure on goods and services from AUS$11 billion in 1996/97 to AUS$37 billion is projected by 2018.
- Payments for wages and salaries are expected to rise from AUS$2 billion in 1996/97 to AUS$7 billion in 2018.
- State and Federal Tax payments are forecast to increase from AUS$861 million in 1996/97 to AUS$3 billion in 2018.
- Over the next twenty years, the economic impacts of Brisbane Airport are projected to increase by more than a factor of 3 over the 1996/97 levels.

AMERICAS

ANCHORAGE INTERNATIONAL AIRPORT, ALASKA

CARGO AS A DRIVER OF ECONOMIC GROWTH

Anchorage International Airport covers an area of 4,700 acres including both international and domestic terminals, as well as a general aviation and air taxi base around Lake Hood. Unlike many airports in other US cities of comparable size, (population of about 250,000), Anchorage International Airport serves not only local households and businesses, but also international cargo carriers, visitors from outside the state, and visitors from other parts of Alaska. Anchorage has 3 times the number of passenger arrivals and 48 times the cargo arrivals expected for its population size.

With its central geographical location on the direct air routes between the US and the Far East, and Europe and the Far East, Anchorage International Airport has developed as a major cargo hub airport for nearly 40 US and foreign cargo carriers. The ability for foreign carriers to transfer cargo between Anchorage and Fairbanks Airports provides the potential for greater flexibility and reduced costs for those carriers – and for more cargo handling jobs in Anchorage.

The Alaskan based Institute of Social and Economic Research has published a series of reports detailing the economic impact of Anchorage International Airport.

Activities at the airport generate considerable off-site employment. As a result, the total economic significance of the airport is substantially more than the US$316 million of payroll directly generated by on-site activities. Off-site employment results from the local spending by the households of airport workers, local purchases of goods and services by the businesses and government agencies at the airport, and to a smaller extent, the purchases by layover flight crews. The total off-site employment resulting from this re-circulation of dollars flowing out into the community amounts to 5,300 additional jobs. The majority of these jobs are in the trade, service, and finance sectors of the economy with an associated payroll of US$130 million.

- **Importance of Air Transport Jobs to The Anchorage Economy.** Anchorage's working population totalled 123,600 in 1997, with nearly 1 job in 10 directly or indirectly associated with air transport. The payroll for air transport (both on and off-site) was US$401 million in 1997, about 10% of the total Anchorage payroll for the year.

- **Airport Compared to Large Employers.** With an on-site employment figure of 8,163 in 1997, Anchorage International Airport is the third largest single employer in Alaska, after the Federal and State Governments.
- **Fourth Largest Economy in the State.** The total number of jobs in Anchorage associated with air transport related industries, both on-site and off-site, is now about 12,100. The only cities in Alaska with total employment greater than 12,000 are the cities of Anchorage, Fairbanks and Juneau, thus making the air transport industry based at Anchorage International Airport the fourth largest economy in the State.

INDIANA AIRPORT SYSTEM

BENEFITS OF AN AIRPORT SYSTEM

The State of Indiana has 110 public airports and heliports that provide a vital link to the national air transportation system. In 1998, the Aviation Association of Indiana published an economic impact study highlighting the value of airports to the local community by demonstrating the link between the community's economic well-being and the financial vitality of their local airport.

- The report showed that the total annual impact of direct and indirect airport economic activity on Indiana's economy is estimated to be more than US$2.3 billion. These expenditures in turn generate an induced annual impact of more than US$1.0 billion. In addition, with transportation cost savings exceeding more than US$370 million, this provides a total annual impact of more than US$3.8 billion.
- Airports mean jobs to communities. More than 15,600 people are employed at Indiana airports. These jobs represent more than US$392 million in direct wages statewide.
- Tax revenues from aviation taxes and fees totaled more than US$2.2 million in 1997. These taxes are paid annually into the state treasury.
- Adjusted for inflation, the economic impact of Indiana airports has more than tripled since 1984.

Airports are an important resource when communities are working to attract, or retain businesses and industries. There are many industries located in Indiana that depend on the close proximity of airports to enable them to serve their particular markets. As a result of the good availability of access to air links, industry locates in Indiana, in turn providing jobs and tax revenue for the state.

EUROPE

VIENNA INTERNATIONAL AIRPORT

CENTRAL EAST/WEST GATEWAY

With its central location between Western & Eastern Europe, Vienna International Airport is increasingly becoming a centre for economic and business relations and an important junction for east-west traffic.

- The airport handles 29,000 passengers a day on average (reaching 45,000 on peak operating days).
- Over 60 airlines provide services to 135 destinations, more than 35 of which are in Eastern Europe.
- In 1998, over one million transfer passengers were recorded, and in the first half of 1999 transfer business grew by almost 20%.
- Passenger traffic growth at Vienna International Airport is forecast to be between 5-6% per year to 2015. Freight traffic is expected to grow at 6-7% per year to 2015.
- A 1998 economic impact study by the Industriewissenschaftliches Institute showed that enterprises at the airport generated a turnover of ATS25 billion in 1996 and paid a total of ATS2.7 billion to the local and national tax offices. In 1996, each person employed at Vienna International Airport generated ATS2.4 million in turnover.
- The study also showed that the airport economic impact was worth ATS11.2 billion in 1996 to the local economy.
- There are 10,500 people working at the airport; with a further 800 people working for airlines in city offices directly dependent upon the airport for their living. In addition, there are some 5,000 employees working for airport suppliers which give rise to employment for a further 4,000 people. The ratio of employees to total passengers shows that one million passengers provide 2,200 jobs for the domestic economy.

To meet the growing demand for air transport, Vienna International Airport has produced Master Plan 2015 which details the measures needed to be taken to handle growth. The expansion measures foreseen by Master Plan 2015, such as the construction of a new runway, as well as the provision of a high speed rail interchange station at the airport, entail significant investment with ATS30 billion already budgeted. This expansion work will stimulate practically all sectors of the economy, and will not only protect existing jobs, but create many new ones as well.

ZURICH AIRPORT

INVESTING TO MEET FUTURE DEMAND

Zurich Airport is run by the Canton of Zurich, which has been authorised by the federal authorities to run the Airport as a self-supporting organisation. The Canton is responsible for planning, construction, maintenance, and operations and has commissioned a wide range of official bodies, mixed-ownership and private companies to work together as associate partners. With effect from April 2000, a change in the law will allow for the privatisation of the Airport. The Canton of Zurich will own around 78% of the shares in the Airport, with the balance held by FIG, the real estate company for the Airport.

Despite a series of development projects over the years, the airport infrastructure has not been able to keep pace with the increase in traffic. The Airport Partners have submitted a comprehensive package of major infrastructure improvements to be implemented over the next decade – known as the 5th Expansion Project. This project will provide a new mid-field terminal and a rapid people mover rail link to existing terminals, better access to public transport connections, new taxiways to reduce airfield congestion and improved cargo handling capabilities.

The project will have direct consequences for the local economy.

- Currently, about 180 companies and government agencies are operating at Zurich Airport, employing over 16,000 full-time and 4,000 part-time staff.
- Directly, and indirectly, the airport and its related services provide employment for approximately 48,000 people. If their families are included, 8% of the population of the Canton of Zurich earn their living as a result of the Airport.
- The Zurich Airport 5th Expansion Project is Switzerland's largest capital investment project with an on-site investment of CHF2.5 billion, generating an overall economic impact of CHF6.3 billion for the region as a result of the main expansion project and follow-up and related investment projects at the airport.

The Impact Of Congestion

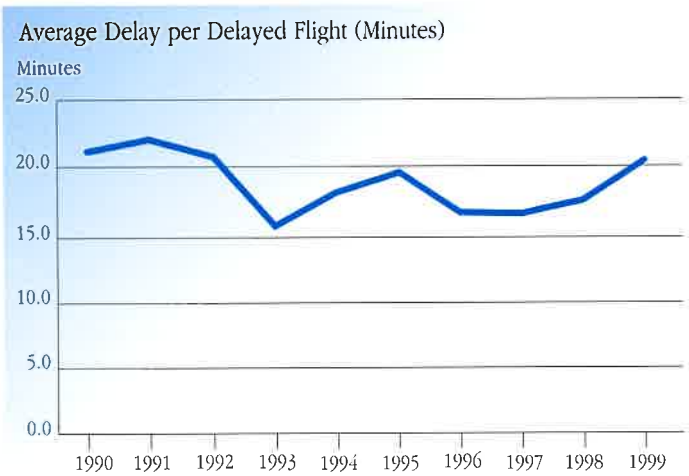
Congestion remains air transport's biggest long term challenge. It causes delays and unreliability for passengers, reduced efficiency for airline and airport operators, and a massive waste of energy and materials.

Following much needed investment in air traffic management infrastructure and manpower, some success has been achieved during the 1990's in both the US and Europe in the reduction of air traffic congestion. However, without a concerted and ongoing plan for continual improvement, congestion is certain to become a major problem for the air travel industry once again.

- In Europe, following the peak in air traffic delays experienced during the summer of 1991, improvements in the European air traffic management system brought about a reduction in average delay time for delayed flights due to Air Traffic Control. However, average delay times for delayed flights are increasing once again with 25% of flights monitored during the first eight months of 1999 incurring an average ATC related delay of 21 minutes.

Whilst a number of external factors, such as the need to re-route air traffic around the conflict in the former Yugoslavia, contributed to the most recent deterioration, the underlying problem remains the continuing lack of a uniform, co-ordinated European air traffic control system. As a result of this totally unacceptable situation, the upward trend in the number of delayed flights, and the length of flight delays, seems certain to continue.

European Air Traffic Control

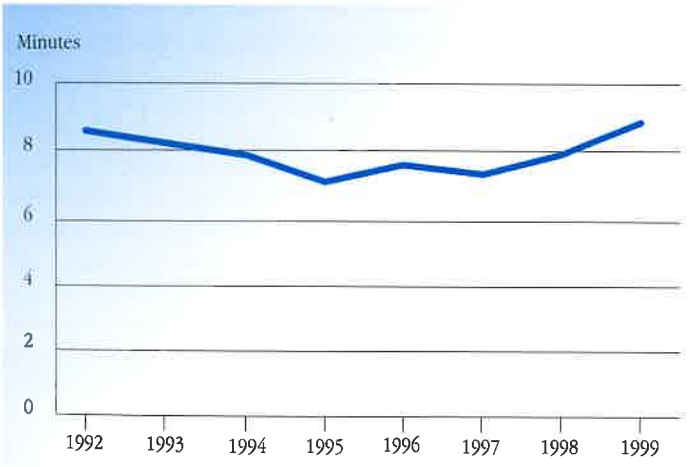


Source: IATA

- In the US, a similar situation exists where following improvement during the 1990's, the situation has started to deteriorate once again. The Air Transport Association of America (ATA) estimated that the average delay among all U.S. carrier departures in 1998 attributable to Air Traffic Control was 7.9 minutes. With more than 8 million departures by the major and national US carriers during that year, this produced a total delay of over 1 million hours. At an average annual utilisation of 3,000 hours per aircraft, this total delay is the equivalent of 'not using' 365 aircraft for an entire year!

During the first eight months of 1999, US carriers experienced an increase of nearly 20% in flight delays compared with the same period in 1998. In July 1999 alone, delays increased by 76% over July 1998.

Air Traffic Control Delay Per Departure (Minutes)



Source: ATA Air Carrier Delay Reporting System

- Congestion on routes from south east Asia to Europe frequently means that aircraft are required to operate at low and inefficient cruising levels. The extra fuel required can mean an aircraft burns between 1.5 and 2.5 additional tonnes of fuel on each trip.

Congestion manifests itself in higher costs for the air transport industry. A 1995 study for the European Civil Aviation Conference (ECAC) showed that the 'improvement potential' in ATC costs to the airlines could be as much as ECU2.5 billion per year, or about 5% of airline total operating costs. Using the same methodology and assumptions as used in the ECAC study, preliminary calculations by the European Union and the EUROCONTROL Performance Review Commission of the cost of air traffic control delays in Europe to airlines and their customers in 1998 indicate a figure between ECU5.4 to 5.7 billion. In the US, air traffic control delays are conservatively estimated by the ATA to have cost airlines and their customers more than US$4.5 billion in 1998, with a 10% increase in cost forecast for 1999. Similar sums could also be lost in the Asia/Pacific region without early concerted aviation infrastructure planning and investment. These estimates do not take into account the related losses to commerce and industry, via increased distribution costs, and the need to maintain higher prices to pay for the inefficiencies of the system.

Continued improvements to aviation infrastructure are required just to keep pace with the growth in air traffic world-wide and significant levels of investment will be required if the current cost of congestion to the global economy is not to increase.

The Penalties of Inadequate Infrastructure

AFFECTED GROUP	NATURE OF IMPACT ON AFFECTED GROUP	ECONOMIC COST TO AFFECTED GROUP	ECONOMIC BENEFITS (TO OTHERS)
1. Airlines	Delays Curtailed growth	Higher operating costs Loss of business (revenues, profit, employment)	Gains by substitutes to air travel
2. Airports	Curtailed growth	Loss of revenues	
3. Air travellers	Delays	Loss of productivity, especially to business people. Higher costs passed on by airlines (loss in real income)	
4. Tourist industry	Loss of revenue due to curtailed growth	Loss of inbound business	Increased revenue for other national economies when tourists change country of destination
5. Labour pool	Fewer jobs due to curtailed growth	Loss of income; concomitant personal social disruptions	
6. Business and industry	Loss of revenue Higher operating costs	Loss of profit to businesses	Increased business activity elsewhere when businesses relocate
7. Governments	Decreased tax and fee income	Loss of revenues	
8. Aircraft manufacturers	Decreased customer demand resulting from congestion	Loss of production as fewer aircraft are required in a severely constrained environment	Gain as more aircraft are needed to offset moderate congestion

An Urgent Need For Investment

The economic benefits of aviation can only be realised if the air transport industry is able to meet the demand for its services. To do so requires major capital investments.

The air transport industry is responding to the enormous growth in demand by investing heavily in new technologies, larger and quieter aircraft, as well as implementing new operational procedures with improved safety levels. Governments and private sector investors have also responded, as exemplified by new airports which have opened in a wide variety of cities, such as Kuala Lumpur, Hong Kong and Shanghai. In the Asia/Pacific region, in addition to new airports expected to open in the next five to ten years, such as Bangkok, there is also substantial investment in renewing airport infrastructure underway in China. In Europe investment in the industry's infrastructure is not restricted to airports alone.

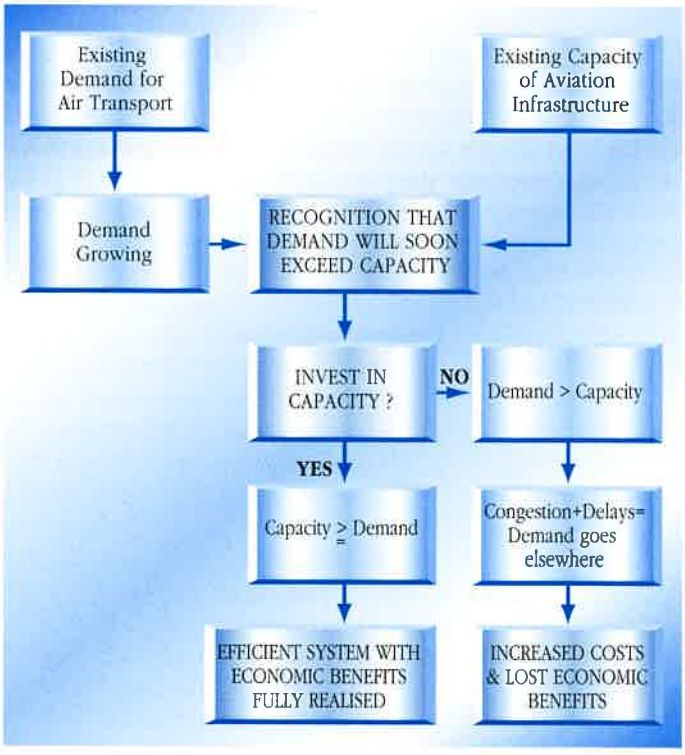
Although substantial investment has taken place during the last decade, greater investment will still be needed in the decades ahead to counter the problem of congestion, both in the air and on the ground, in the key regions of Europe, North America and Asia. A recent ACI study indicates that forecast capital expenditure (excluding expenditure on new airports) on airports for 1999 will reach nearly US$22 billion. If this level of capital expenditure is maintained over the next 15 years this would result in total expenditures of over US$300 billion. However, if the required projects are not realised, the resulting inaction will significantly jeopardise the potential for both regional and global economic progress.

More important than just pure financial investment is the political investment and agreement needed to bring about necessary improvements in efficiency in air traffic management, particularly in Europe. Although the European airline industry has been subject to, and benefited from, liberalisation measures introduced by the European Union, the same is not true for air traffic control service providers. The present uncoordinated network of individual national air traffic management authorities continues to restrict Europe's ability to take pan-European action to combat congestion and plan efficiently for future changes in air traffic demand. The industry, ECAC and EUROCONTROL have developed an ATM 2000+Strategy which seeks to "generate extra capacity to meet demand while reducing unit costs and increasing safety levels." Its guiding principle is One Airspace for Europe, unconstrained by national boundaries and planned and operated as such. If fully implemented, ATM 2000+ would provide for ATM developments until 2015. Liberalisation of ATS provision should gradually be implemented thus allowing providers to operate on a

commercial basis. Ownership could range from state-owned to privatised entities as appropriate. Implementation or ATM 2000+, and liberalisation of ATS provision could produce a much more efficient European system and strong political action is needed to ensure that these and other improvements take place. The same political will is also required to counter the growth of congestion in the US where the existing air traffic control system needs to be overhauled, with the introduction of a better system of management, including the ability to manage weather delays in a more efficient manner.

Another priority for increasing the capacity of the world's airspace and airports is the timely and cost effective introduction of aircraft communications, navigation, surveillance and air traffic management (CNS/ATM) systems which utilise satellite based technologies. CNS/ATM which is already in use in certain parts of the world, permits a reduction in aircraft separation without compromising safety. It provides more accurate navigation and

The Case for Investing in Aviation Infrastructure



tracking, and it facilitates improved communications. Airport efficiency and capacity is enhanced as each aircraft's time in the immediate vicinity of an airport is minimised. Scarce runway capacity at congested airports is more efficiently utilised and ground guidance systems are enhanced at airports equipped for low visibility operations.

Airport capacity and ground transport links will need to be enhanced in tandem with the expansion in the capacity of the world's airways. Ultimately, little benefit will accrue from putting more people and planes in the air unless there is sufficient runway and terminal capacity to allow them to land and disembark. If surface access links are not improved, runway and terminal congestion problems will not be solved, but will be transferred to the roads and highways that link airports to the city centres they serve.

While airspace congestion can be reduced through the implementation of co-ordinated and more efficient systems of air traffic management, there is no single solution for solving congestion on the ground. Good planning and close co-operative links between airport authorities and their local and national governments can help, but each locale is unique and the solutions required must be carefully tailored to the needs of the region. The common theme is the need to maximise the efficient use of existing capacity and, where necessary, to provide additional capacity to meet the forecast rates of growth in demand for air transport. Otherwise, the congestion problems of today will steadily worsen, curtailing the substantial global economic benefits that air transport generates.

Final Words From The Industry

The following statements, made by industry leaders, have been extracted from various published documents and reports:

"International air transport is a world system. That system is an important contributor to the quality of life of people, its use is high on the list of most peoples' aspirations; it is an essential component of world business globalisation. It is both desirable and necessary.

If any one part of the world were to choose to opt out of the system, then, if that is the democratic choice of all of its people made in the light of a full assessment of all the costs and benefits, one must respect that choice. But, if there is an accidental opting out, through neglect of infrastructure, then that is something else entirely!

Unfortunately – this latter scenario is dangerously possible."

Pierre J Jeanniot, O.C., Director General, IATA.

"Air transport and the many industries which support it, contributes more to world GDP than any other industry or service. Besides providing high levels of employment this industry provides both investment opportunities and public service vital to an increasingly global economy. Constraints on growth, be they either political or operational, perform a real disservice to the world's economy."

Jonathan Howe, Director General, Airports Council International.

Final Words From The Industry

"Air transport is the consumer's preferred mode of transportation. When all the factors are properly weighed, air transport is one of the safest, most economically efficient, and most environmentally friendly means of travel, combining small total land usage with modest emission levels for the distance covered. Better infrastructure, primarily improved airports and air traffic management, would ensure a more efficient use of airspace, lower costs, and a reduction in emissions."

Philip M Condit, Chairman & CEF, Boeing Commercial Aircraft Group.

"The recent financial and economic crisis in Asia was faithfully mirrored in the results of the carriers of the region. Equally, the first signs of recovery have been prefigured in the renewed growth of traffic. More significantly, the maintenance of air links within the region for both passengers and cargo, throughout the crisis, acted as a catalyst for the resurrection of business, tourism and trade. Those links proved to be an essential element in the incipient recovery we now see in Asia.

In these circumstances, it would be a tragedy if this transitory upset on the road of economic development should induce governments in Asia to slow down, or even halt investment in regional aviation infrastructure projects such as airports, new terminal facilities or the introduction of CNS/ATM. It would postpone or deny to many of their citizens the wider socio-economic benefits improved air services can bring, particularly in the less advanced countries."

Richard T Stirland, Director General, Association of Asia Pacific Airlines.

Final Words From The Industry

"According to the World Travel and Tourism Council, travel and tourism, encompassing transport, accommodation, catering, recreation and services for travellers, is the world's largest industry and is expected to generate US$4.4 trillion of economic activity (total demand) and 231 million jobs (direct and indirect) world-wide in 1998. These figures are expected to grow to US$10 trillion and 328 million jobs by 2010.

In the APEC economies alone, travel and tourism is expected to produce US$2.1 trillion of total demand and 89 million jobs (direct and indirect) in 1998. By 2010, APEC travel and tourism is expected to total US$4.6 trillion of total demand and 124 million jobs. As these figures show, travel and tourism is a high growth industry. The Asian crisis may have kept many would-be tourists at home over the past year, but the long term future of the travel and tourism industry as a whole, especially its job creation capacity, remains strong. Earlier this year, Bill Gates said that Microsoft is targeting travel and tourism, along with healthcare and education, as the primary growth markets of the 21st century."

Dr. Cheong Choong Kong, Deputy Chairman and Chief Executive Officer, Singapore Airlines.

"Air transport is one of the largest, fastest growing industries in the world contributing to every sector of the economy either directly or indirectly. Technology has played and continues to play a decisive role in this success by providing the market with continuously improved Aircraft especially in terms of economics and the environment. To ensure that everyone will benefit from Air transport in the future, proper infrastructural investments have to be decided today to guarantee the expected development for tomorrow."

Noel Forgeard, Managing Director of Airbus Industrie.

ACKNOWLEDGEMENTS

This report draws on research carried out by a variety of specialists into the economic importance of air transport. Amongst the organisations that have provided data and assistance, special recognition should be given to the following:

Aerospace Industries Association of America

Airbus Industrie

Airports Council International

Airports Council International - European Region

Air Transport Association of America

Airtrans

Anchorage International Airport

Arthur D. Little

Association of European Airlines

Aviation Association of Indiana

Avitas, Inc.

Boeing Commercial Airplane Group

BAA

Brisbane Airport Corporation

City of Los Angeles Department of Airports

Coopers and Lybrand Management Consultancy Services

European Regions Airline Association

Eurostat

Federal Aviation Administration

Flughafen München GmbH

Gellman Research Associates

ACKNOWLEDGEMENTS

Heathrow Airports Limited

Hong Kong International Airport

Houston Airport System

International Civil Aviation Organisation

Institute of Air Transport

Japan Aircraft Development Corporation

Kurth & Company, Inc.

Martin O'Connell Associates

Metropolitan Nashville Airport Authority

Netherlands Foreign Investment Agency

Pacific Asia Travel Association

Rolls Royce

SRI

Transport Canada

Vancouver International Airport Authority

Vienna International Airport

Wilbur Smith Associates

Wilmer, Cutler & Pickering

World Tourism Organisation

World Travel & Tourism Council

Zurich Airport Authority

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Design & Production:
SHAHROKH KHOSHOIE

Prepared for

AIR TRANSPORT ACTION GROUP

by

INTERNATIONAL AIR TRANSPORT ASSOCIATION