AIR TRANSPORT STUDY FOR THE CANARY ISLANDS

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Prepared for:
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1. INTRODUCTION

This report provides a summary of the findings of the SRI Air Transport study for the Canary Islands. This study, which was commissioned by the Consejero de Turismo y Transportes de Gobierno de Canarias (CTT), was conducted in the second quarter of 1992. The main objectives of the study were to:

1. Determine the principal macro economic influences affecting the Canary Islands.

2. Assess the air traffic requirements of the Canary Islands over the period of 1990-2010 under different scenario conditions.

3. Examine present positioning and offer alternative strategies for air transport in the Canary Islands under different scenarios, based on SRI's findings during the study.

The report consists of an Executive Summary which summarises the findings and recommendations and a series of analytical sections which deal with the main topics of the study. The study database for the seven commercial airports within the Archipelago is contained in the Appendix A.

The production of such a report required the participation of many individuals. The SRI team wishes to acknowledge the outstanding co-operation received from many busy air transport professionals during the course of this study.

SRI also owes a special debt to the directors and staff of the Direction General de Transportes and in particular Mrs Alicia Soriano. Her unstinting efforts in providing introductions, arranging and attending meetings and generally assisting the SRI team greatly facilitated our efforts.

2. EXECUTIVE SUMMARY

2.1 Introduction

The Canary Islands compete for tourists (or more precisely a percentage of the discretionary spending of the populations of the originating countries) with alternative destinations offering similar or in some cases completely different attractions. To continue to succeed the islands must present a clear image of the "product" or "products" which they wish to offer. Because of the islands high dependency upon tourism it is important as far as possible that these products are of an enduring appeal and not subject to the vagaries of fashion. It seems likely that developments such as time share apartments and villas and moves to encourage non-resident property ownership will be more effective in ensuring a long term commitment to the islands by individual tourists than the conventional inclusive tour (IT) based products.

In determining their competitive posture the islands must also recognise the trade-off between the absolute number of tourists and the amount spent by each individual. Whilst overall numbers for both the low budget and the silver hair/golden pockets tourists are likely to increase, the numbers involved in each case are different and policy decisions to attract more of one or the other will have an impact on the type of developments required both in terms of accommodation and in tourist infrastructure, eg airports etc. It is also important to note that even at the low budget end of the market, tourists' expectations are constantly rising and this trend seems certain to continue.

Tourism is vital to the continued prosperity of the islands. No other sector of the economy can offer any prospect of matching the contribution to GDP and employment offered by the industry. To ensure that the islands continue to attract a significant proportion of lucrative tourism it is essential that the tourism policies reflect the islands' objectives. Moreover these policies must be supported by a continuous process of infrastructure upgrading which will facilitate the meeting of the objectives and enhance the non-tourist economy.

It is essential that each island that wishes to attract tourism must be able to offer a safe, world class modern airport facility which can handle the large aircraft increasingly used by charter airlines and the passenger flow associated with peak hour traffic. Tourism is not, however the sole reason for air transport within the Archipelago. The social, political and economic interaction between the islands, and between the islands and peninsular Spain requires frequent, efficient air transport links which in turn require suitable airport facilities and air transport infrastructure. Yet airport facilities and air transport infrastructure Air Traffic Control (ATC), radar, ground to air radio links etc) are not themselves sufficient to ensure the smooth operation of air transport services. In addition efficient air carriers are required and the entire service must be smoothly integrated into the life of the community if air transport is to make the maximum contribution to the economy.

2.2 Concerns

During the study it became apparent that the islands are falling short of world class standards in some important respects. Some limitations are already well known.

1. Gaps in radar coverage below 12,000 ft to the west of Tenerife continue to raise safety questions as well as constraining air flow in this zone of the Canary Islands TMA. Plans and budgets to eliminate the problems are ready but their implementation is blocked by political opposition on Hierro (the optimum site for siting the necessary long range radar).

2 Many of the Canary Islands air traffic movements have to transit Casablanca FIR. Currently installed equipment severely constrains the acceptance rates offered by Casablanca FIR. These limitations are beyond the direct responsibility of the Autonomous Government or indeed the government of Spain and have to be solved through the relevant international bodies, and negotiations with Morocco. Unfortunately the improvements to European Traffic Flow management arrangements, under various coordinated initiatives, do not apply to Morocco. Additional routes are being opened through Lisbon FIR but these will not eliminate the capacity constraint. Unfairly, delays arising from this inadequacy will be associated in the minds of the travelling public with travelling to/from the Canary Islands.

Other areas for concern are :

3. The continued inability of the monopoly carrier to operate inter-island services on a profitable basis. The commendable initiative in establishing Binter Canarias and the introduction of efficient, modern, turbo-prop aircraft has not been accompanied by a sufficient reduction in total costs to put inter-island air transport on a sound financial footing. SRI does not accept that such services must inevitably be subsidised. At the (realistic) fare levels charged for inter-island services, it should be possible for Binter Canarias (or another operator) to generate profits. This must be the short term aim in order to guarantee the medium to long term growth of the inter-island air services which are needed to facilitate balanced economic growth.

4. All seven Canary Island airports will experience some form of constraint on their capacity under realistic demand scenarios within the timeframe covered by the study unless additional development takes place. SRI was not allowed access to AENA's expansion plans during the study and it is probable that plans exist to eliminate at least some of these problems but until these plans are revealed doubts must remain. A particular concern is the inability of all but three of the airports (Gran Canaria, Lanzarote and Tenerife Sur) to

handle the widebody jets increasingly being used by European charter airlines. Failure to cater for this class of aircraft will diminish the attractiveness of La Palma as a destination to some carriers and tour operators. The nature of the other constraints will show as increased delays and degradation of airline and passenger service.

5. The efficient handling of passengers at peak periods is also a matter of some disquiet. There is evidence that the processing time at check-in is unacceptably high, particularly for charter travellers. Moreover, the general airport facilities and passenger flow at some of the main tourist airports do not meet the highest international tourist standards. SRI also questions whether the monopoly ground handling arrangement at the main airports are likely to provide the best service to either airlines or passengers. It could be that allowing other ground handling agents to perform these services would improve matters.

6. The integration of the airports and the services they provide into the life of the islands must be improved. The inter-island air hubs (Gran Canaria and Tenerife Norte) lack adequate car parking while at Gran Canaria coaches transporting tourists routinely double park because of lack of suitable parking stands (the new planned terminal should eliminate this last point). Surface flow management between the main tourist destinations is poorly coordinated at peak periods.

Currently for all inter-island air journeys a major part of the total journey time is made up of non air travel components. SRI hypothesises that the demand supply curve for inter-island travel by residents in part could have flattened at its' present level due to disposable time constraints. Thus reductions in the total elapsed time could give an increase in demand without price or disposable income changes. Just as important is improving the predictability of a given journey time. In order to achieve this initiatives are required in regard to; airport car parking, integration of public surface transport timetables with inter-island air schedules, kerb side check-in, shuttle services on some island pairs, et al.

At present inter-island tourist flows are minimal. SRI hypothesises that in part this is due to non availability of suitable inter-island tourist products but also it is caused by current airport and ground transportation arrangements. The products would have to include excellent point to point assured journey times (ie very smooth and speedy check-in procedures), good transport arrangements at both airports, access to points of interest, etc.

Failure to integrate airports and air services into the islands, reduces their attractiveness to tourists and tour-operators as well as inhibiting the free flow of inter-island traffic for both residents and visitors.

7. The local government agencies do not appear to have a day to day involvement with Airport and ATC management on a scale which reflects the criticality of air infrastructure performance to the success of the Archipelago's tourist offerings. Although they do have a clearly defined input into the air traffic planning and development processes, this is reactive rather than proactive.

8. Land use planning around the airports is not a significant environmental issue at this time, SRI counsels that the issue of adequate airport buffer zones and development within these zones may become crucial to future unconstrained operation at some airports. The issue needs to be dealt with before development takes place.

2.3 Economic Impacts

The direct, indirect and induced effects of commercial aviation in the Canary Islands are widespread and highly significant, contributing an estimated US $242 million to the local economy and generating close to 26,000 jobs. The benefits are not evenly distributed across all the islands but are skewed towards Gran Canaria and Tenerife which in part reflects their role as aviation hubs. Since 1982 Canary Islands' air transport movements have doubled with consequent employment effects. Constraints will jeopardise this growth rate and could mean that the annual creation of upwards of 2000 new jobs and US$19 millions of additional expenditures per annum could be put at risk. Figure 2.3.1 indicates the "at risk" impacts by 2010 under three demand scenarios.

The capital costs of overcoming the identified restrictions are such that payback periods are less than two to three years just on a consideration of the air transport impacts.

The possible effect of constrained air transport on the Canary Islands' tourist industry is so substantial that no risk should be taken with this key industry. The inefficiency cost of some degree of over-supply is far less than the risk weighted revenue and employment losses for constraint impacted tourism.

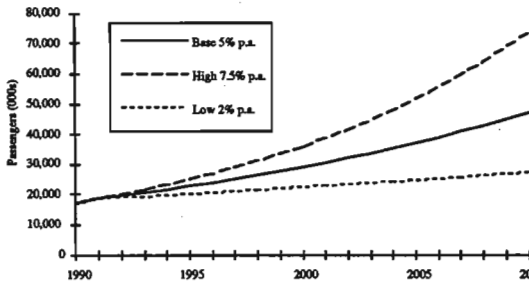
2.4 Capacity Constraints

The study did not include the construction of a demand forecast for the Archipelago's airports. Instead SRI used three air traffic demand scenarios to review possible constraints and likely timings. These forecasts are illustrated in Figure 2.4.1. As mentioned above since 1982 air transport movements have doubled. In spite of the global aviation downturn in 1991 air movements grew by 11% with respect to 1990. In the first quarter of 1992 a growth rate of 13% was noted with respect to first quarter 1991.

Figure 2.3.1
Economic Impacts

	Direct		Indirect		Induced		Total		2010 Low		2010 Base		2010 High	
Island	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)	Employment	Expenditures ($000's)
Gros Cousin	2,900	97,900	1,250	13,500	7,500	56,250	11,650	164,700	17,175	162,165	29,765	281,300	46,977	439,892
Lamentin	450	6,750	225	3,250	1,750	10,125	2,425	19,925	3,315	31,397	5,750	54,365	8,991	84,917
Tarouille	3,882	91,250	1,941	38,410	6,346	46,845	9,369	87,405	25,145	143,833	26,271	248,118	41,882	387,985
La Poterie	251	3,402	116	1,155	985	5,198	1,846	9,918	1,875	15,864	2,985	27,417	4,540	42,982
Sirene	75	1,125	36	572	225	1,688	336	3,186	559	4,907	905	8,526	1,411	13,325
Pierremoune	356	5,340	178	1,780	1,068	8,010	1,602	15,130	3,084	27,299	5,002	47,348	7,825	73,861
TOTAL	5,894	85,418	2,947	59,476	17,892	128,115	25,623	241,905	40,709	384,476	70,614	666,908	110,434	1,042,896

Figure 2.4.1
Air Passenger Movements under Three Growth Scenarios



These demand scenarios were applied to six key elements of airport infrastructure, with due allowance being made for the peak effects of the traffic flows. Figure 2.3 2 indicates when constraints would start to take effect at each airport under different scenarios.

Air traffic control and airspace capacities were also considered. The key constraint is the acceptance rates of adjacent traffic management areas. Although new routes and European Air Flow Management are being implemented the inability of Casablanca air traffic to handle Canary Island air flows at peak periods can and will lead to increasing "Canary Island Air Traffic Delays".

2.5 Action Plan

Air transport is crucial to the current and future prosperity of the Canary Islands. Its development will take place in a continuing and evolving European liberalization framework. The air infrastructure of the islands has a good starting point but needs to overcome some immediate problems and thereafter endeavour to stay ahead of the facilities offered by competing destinations.

The results of this study indicate that the current airway structure and air traffic system, which is already manifesting signs of congestion, will present a severe constraint to growth at peak periods beyond 1994 without resolution of acceptance rates across Casablanca FIR. In general the airports on the islands have an immediate issue in regard to the adequacy of their service to passengers at peak periods. Unless urgent actions are taken it is also likely that the key tourist and inter-island hub airports will be physically constrained by 2000.

SRI recommends a series of actions which added to initiatives now in motion, will begin to remove these constraints to air transport and the further economic progress of the Canary Islands. These actions divide into two categories, those recommendations addressed primarily to the Autonomous Government (prefixed with a C) and those actionable by a variety of stakeholders and where the Autonomous Government should take an enabling role (prefixed with a E)

CTT are already involved in various aspects of the Canary Islands air transport. SRI has identified seven specific recommendations for CTT. The prerequisite is a commitment by the Autonomous Government to the increased funding required to support the additional efforts required. CTT will have to be the facilitator in ensuring that the various interested parties move towards providing the Canary Islands with a world class air transport system.

Figure 2.3.2
Year in Which Various Capacity Elements Might be Constraints at Various Canary Islands Airports

	AIRPORT																	
	Fuerteventura			Gran Canaria			Hierro			La Palma			Lanzarote			Tenerife Norte			Tenerife Sur		
CONSTRAINTS	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H
Runway Configuration						2003	1998								2005			2010	2003			2003	1998
Taxiways/Exits	2007	1998	1996			2001	1997			2005			1998	1995		2002	1998	1992	→		1992	→	
Terminal Capacity	2010	1999	1996			2002	1998						2007	2002		2004			2004		1992	→	
Terminal Facilities	1992	→		1992	→											1992	→				1992	→	
Apron Capacity	1992	→																	2005	2000		2000	1998
Landside	1992	→		1992	→																		

Note: The above table was prepared using information made available to SRI during the course of the study

SRI Recommendations for CTT and Enabler Actions

Reference	Action Item	Concerns	Time Frame	Report Section
C1	Commit to funding and staffing the action plan implementation.	All	Immediate	All
C2	Work with the Madrid authorities and Canary Islands FIR managers to eliminate the Casablanca air traffic acceptance constraint.	2	Immediate	4
C3	Develop a Canary Islands airport capacity monitoring program covering such items as: - air transport delays and reasons - progress in eliminating identified constraints - arriving and departing passenger surveys - average passenger per aircraft movement	2, 4,5,6,7	Sept. 1992	4, 6
C4	Establish air transport key indicators tracking program covering such items as: - GDP per capita and air fare treads in the originating countries - "fashion", ageing populations and market positioning	4, 5, 6	Sept.1992	3
C5	Establish a tour operator and air carrier public relations program	2, 4, 5,6	Dec. 1992	3, 4, 5, 6
C6	Investigate labour costs and productivity for inter-island air services and ground handling and targeting of existing subsidies to motivate towards lower cost solutions.	3	Immediate	4
C7	Review check-in procedures and rules at the airports	5, 6	Immediate	3, 4, 6
E1	Ensure low cost inter-island air transport provision	3	Immediate	4
E2	Encourage Hierro authorities to agree to the proposals for the elimination of the TMA radar blind spot	1	Immediate	4
E3	Encourage the use of the Canary Island ATC facilities for the development of the islands	6	Oct. 1992	3, 4
E4	Link small islands' development policies with air transport facilitation	6	Sept. 1992	3
E5	Ensure land use planning takes account of airport buffer zones needs	8	Dec, 1992	6
E6	Investigate satellite communications links for the islands	1, 6	Immediate	3, 4
E7	Switch subsidies to developing airport infrastructure	3, 4, 5, 6	Sept. 1992	4, 6
E8	Reduce inter-island product distribution costs	3	Immediate	4
E9	Review charter and inter-island check-in and passenger handling procedures	5, 6	Immediate	6
E10	Ensure that airport maintenance and repair is carried out in off peak periods	4, 5, 6	Immediate	3, 6
E11	Review all airport and air transport monopoly arrangements	3, 4, 5	Immediate	3, 5, 6

2.6 Strategy Options and Agenda for Future Action

CTT invited SRI to carry out this study to assess the air traffic requirements of the Canary Islands over the period of 1990-2010 under different scenario conditions, to determine the principal macro economic influences, examine present positioning, and offer alternative strategies for air transport in the Canary Islands under different scenarios. During the study SRI

drew conclusions across various aspects of Canary Islands air transport and has proposed various action items as shown in the above tabulation.

The study has shown that, from 1992 until 2010, there is no alternative but a strategy to ensure a broadly unconstrained air transport infrastructure for the Canary Islands. Any other approach puts at risk the economic well being of the whole economy. There is scope for debate as to the degree to which the Canary Islands based infrastructure should satisfy peak demands before users (airlines and passengers) experience significant delays. Again, SRI considers that, with increasingly competitive world tourist markets, it is best to have a minimum composite delay strategy even at peak periods. SRI recognises, however, that certain capacity elements (ie queuing for check-in) have a far greater impact on passenger perceptions than others (ie coach parking), so in setting priorities SRI recommends that those delays of greatest impact on the users (airlines, tour operators and passengers) are dealt with first. In order to prioritise and progressively overcome any shortcomings, we suggest that CTT set up mechanisms with the relevant stakeholders to constantly monitor the performance of different capacity elements and to discuss how best to eliminate them.

SRI considers that, whilst it is essential that there exists an excellent inter-island air transport service, the need to subsidise this service is open to question. SRI would counsel policies that promote a low cost solution to regular services, perhaps by combining rapid liberalisation of participation in this market, phase out subsidies and introduce low cost ground handling approaches. SRI recognises that it is equally tenable to continue with existing policies, but eventually these will need to be modified to take account of European air transport liberalisation.

Action items for future debate and resolution are:

2.6.1 Commit to funding and staffing the action plan implementation (C1).

Pragmatically, we anticipate that few recommendations will be actioned by the relevant stakeholders without some sustained education and/or lobbying effort. CTT are already involved in various aspects of the Canary Islands air transport. CTT will have to decide which efforts to support and allocate resources to these efforts. Supporting some of the initiatives will require a significant manpower and expense commitment.

2.6.2 Assure Airway capacity (C2, E2, E3 and E6)

2.6.2.1 The main traffic flows to/from the Canary Islands will continue to come from Europe over the time period reviewed. It is essential to the tourist industry that the airway capacity is able to deal with these flows as well as en-route traffic (ie Europe to Latin America) without significant delays even at peak periods. The critical factor in this

regard are the acceptance rates of the Casablanca FIR. The Canary Islands cannot risk a reputation for air traffic delays due to this restriction. National and international anthorities have initiatives under way but the matter is of such import to the Canary Islands, that CTT must mobilize local public/political support and urgently encourage the Madrid authorities and Canary Islands FIR managers to eliminate this Casablanca air traffic acceptance constraint as soon as possible.

2.6.2.2 Public confidence in the safety of any Air Traffic System is crucially important, and although the Canary Islands FIR operates to the highest European standards the continued existence of the TMA radar blind spot is a public relations disaster waiting to happen, particularly in some of the more safety conscious origin markets (ie Scandinavia). SRI suggests that CTT use every channel either to encourage the Hierro authorities to agree to the siting of a new long range radar, and/or to investigate advanced solutions such as satellite based systems, and/or site the planned alternative approach radars on Tenerife.

2.6.2.3 The Canary Islands ATC operating facilities are a world class centre of expertise and capability. Their management feels and SRI concurs that they can make a much more positive input and assistance to the development of the islands. SRI suggests that CTT establish and chair a working group with the relevant managers and other Autonomous Government departments to permit such a process.

2.6.3 Ensure Airport Capacity (C3, C4, C5, C7, E5, E7, E9 and E10)

Airport capacity and delays are closely related. Thus, for practical purposes, the airport capacity for the Canary Islands airports can be considered to be the number of movements (aircraft and passengers) during a specified interval of time corresponding to a tolerable level of average delay. Delays also impact airline costs, fares and ultimately demand. SRI hypothesises that delay history has an important influence on the types of tourist and cargo traffic that a given destination may attract and the consequent yield to the Canary Islands economy. Therefore SRI considers that the remit of CTT should expand to include the proactive management of delay trends at the Canary Islands airports and the consequent impacts on the islands' tourist industry.

2.6.3.1 The implementation and fulfilment of such a role requires that CTT staff define, assemble and maintain a delays/capacity/demand database with the cooperation of the airport and airspace managers, airlines, and tour operators. This fully functional database should include such items as average passengers per aircraft movement, arriving and departing passenger surveys, delays and reasons, key origin market socio-economic indicators, etc. Rolling demand forecasts and actual demand details should also be gathered to facilitate capacity versus demand assessments (the forecasts will probably require updating at the close of each of the three annual tourist seasons and should cover at least the next ten years).

SRI proposes that consultation with industry stakeholders should take place before the construction of the database, on the data elements to be collected, the timescales and the definitions applicable to this data. Demand forecasts details should be assembled under agreed definitions from all the interested groups. It may be necessary to coordinate the data assembly with similar European-wide initiatives being undertaken separately by ECAC and the EC to minimise the data collection required by airlines and airports.

2.6.3.2 SRI would recommend that CTT set up an industry consultative group in conjunction with 2.6.3.1. This group would assist in defining capacity issues, suggest solutions and be in part responsible for their implementation. In parallel SRI would suggest that a public relations program is established for all tour operators, air carriers and other stakeholders. This program is to ensure not only good communications but also that all parties not directly participating in the consultative group can still "buy into" its' deliberations. Topics for immediate debate and resolution by such a group include:

2.6.3.2.1 SRI considers that the existing check-in arrangements, procedures and rules at the airports are already inadequate to meet the requirements of the IT traffic. SRI would suggest that CTT carry out a detailed review of current practices, determine passenger requirements, compare against best world practice and make recommendations to the consultative group as to possible corrective actions. (In Appendix B of this report SRI highlights some of the trends in passenger handling arrangements worldwide.) Solutions might include inviting competitive tenders from other service providers, new relationships/responsibilities between stakeholders, etc. The review should also consider whether or not special arrangements should be made for certain classes of traffic (ie charter and inter-island).

2.6.3.2.2 Although all the airport infrastructure is funded by central government there may be operational areas where some additional short term subsidies might act as a catalyst for desired changes. Examples include funding of experiments with passenger handling, automated inter-island ticketing, etc. The views of the consultative group should be sought on such issues.

2.6.3.2.3 SRI notes that considerable inconvenience has been caused to certain tour operators/charter airlines by the closing of Tenerife Sur to carry out runway repairs. SRI would recommend that in future such airport maintenance and repair schedules are agreed with the affected operators through the committee and that as far as possible the work is carried out with minimum inconvenience to airlines.

2.6.3.2.4 There is scope for improvement in the coordination of IT passenger surface flows. CTT should request suggestions from the relevant stakeholders on how to improve the situation.

2.6.3.2.5 SRI considers that there may be scope to improve the direct, indirect and induced economic benefits of air transport for the smaller islands. To realise this potential requires coordination between the air transport providers, tour operators and the development planners. CTT needs to develop a list of possibilities for review by the consultative group. Examples include better inter-lining with flights to/from the Archipelago, improved inter-island hubbing arrangements (cargo and passenger), encouragement of day trips products, etc.

2.6.4 Improve inter-island air transport cost performance (C6, E1, E4 , E8 and E11).

2.6.4.1 SRI considers that it is essential that inter-island services should operate on a profitable basis. Initial indications are that whilst fare levels are in line with world averages for similar operations, that costs are higher than average. SRI would recommend that CTT should investigate labour costs and productivity for inter-island air services and ground handling with a view of targeting existing revenue enhancement subsidies towards rapid implementation of lower cost solutions.

2.6.4.2 SRI considers that some cost reduction opportunities could well be addressed through discussions with the consultative group. Possibilities include inter-island product distribution costs through changes in the current inter-island computer reservation and ticketing arrangements. It may be that some of the participants might well wish to make proposals which utilise their own systems.

2.6.4.3 SRI would also recommend, concurrent with 2.6.4.1, that CTT reviews all airport ground handling and air transport monopoly arrangements in the Canary Islands. SRI considers that the latest EC aviation package proposals are ample justification for such an analysis so that the Autonomous Government may take a view as to when and if the third package would be applicable to the Canary Islands. SRI believes that such a review will confirm that the best interests of air transport in the Canary Islands lie in deregulating all of these operating functions.

2.6.5 Establish airport buffer zones (E5).

SRI recommends that, although this is not currently an issue, CTT need to initiate a debate with the land use planning authorities to ensure that regulations are implemented to block the possibility of residential developments around the airports which, might in the future, lead to an environmental lobby restricting airport operations.

3. MACRO ECONOMIC INFLUENCES AFFECTING THE CANARY ISLANDS

3.1 Overview

Since the advent of mass air tourism the Canary Islands have been extraordinarily successful in developing the potential of the Archipelago and as a result of this success tourism has become the dominant factor in the economy of the islands. The degree of this dominance is even greater than for Spain as a whole which in itself is the European nation most dependent upon tourism. In 1989 the services sector (mainly tourism) within the islands accounted for 72% of Gross Domestic Product (GDP) and 68% of employment. See Figures 3.1.1 and 3.1.2.

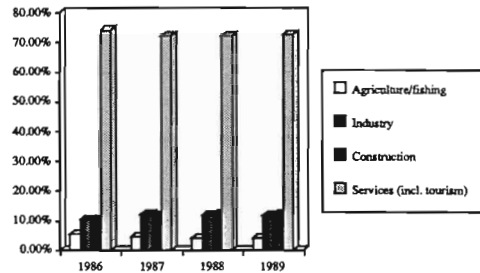
This heavy dependence upon a single industry (and the consequent effect on other industries in the islands) does of course mean that the islands' economy is heavily reliant upon the continued economic well being of the countries from which it draws the majority of its tourists.

At present time 60% of the islands' tourists are drawn from Germany and the United Kingdom with the majority of the remainder coming from other countries in Northern Europe (See Figure 3.1.3). Although the economies of Northern Europe have experienced a slowdown in the early 1990s, the Canary Islands have not, to date, been affected by any downturn in the number of tourists. In fact 1991 showed a marked growth compared with 1990 (as shown in Figure 3.1.3) and early 1992 is showing a continuation of this trend. This upsurge may reflect a reluctance of holiday makers to visit the Eastern Mediterranean, because of the unsettled circumstances in the Gulf during the crucial early 1991 Spring booking period, reinforced in 1992 by the Balkan situation. Despite the hiatus in the worldwide tourism industry in 1991 caused by the Gulf war and the widespread economic downturn, the medium and long term prospects for the industry remain excellent.

In terms of tourism to the Canary Islands air transport is, and seems certain to remain, the predominant mode of travel. Whilst historically tourists have overwhelmingly arrived on charter airlines and as part of IT packages, a combination of factors, including European air transport liberalisation, increasing affluence, growth of villa/apartment vacations and greater familiarity with the way of life in other countries, means that a greater proportion of independently travelling tourists can be expected in the future. Thus, trends in air transportation as a whole become a vital factor in the evolution of tourism to the islands.

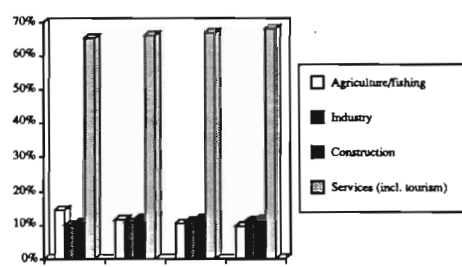
GDP per capita is the single most important determinant of the level of air travel generated by any given country and after the break arising from the recession of the early 1990s GDP seems set to resume its upward growth.

Figure 3.1.1
Canary Islands Gross Domestic Product by Sector 1986-1989



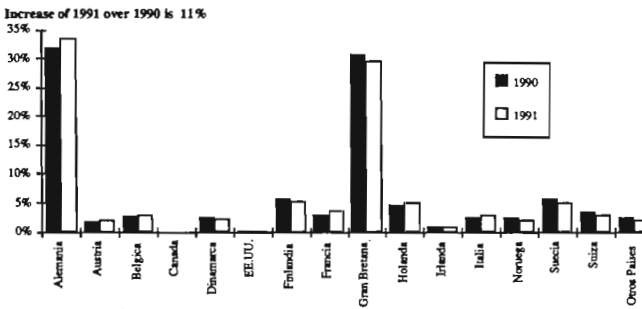
Source: FT/SRI

Figure 3.1.2
Canary Islands Working Population by Sector 1986-989



Source: FT/SRI

Figure 3.1.3
Origin of European Tourists to the Canary Islands 1990-1991



Source: Consejero de Turismo y Transportes de Gobierno de Canarias/SRI

Moreover, there is evidence that although GDP and air travel are closely related, the relationship is not linear but one in which air travel rises faster than GDP. See Figure 3.1.4. Thus as more of the world's population reaches the level of affluence associated with GDPs of the levels pertaining in the G7 countries and enjoys increased leisure time as well as greater disposable incomes, absolute levels of air travel will increase disproportionately.

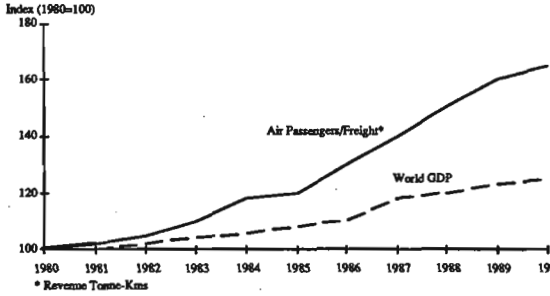
The easing of tension between the Eastern and Western power blocs and the reduction in international terrorism have also removed some of the inhibiting factors which reduced people's propensity to travel. In addition to these factors, deregulation and privatisation have promoted competition and with at least temporary over-capacity in the aviation marketplace, fare wars (reinforcing the long term decline in air fare levels - see Figure 3.1.5) and extensive promotional activity are likely to ensure that passengers (although perhaps not profits) make a speedy return to the airlines.

Whilst all these factors appear positive in terms of the continued growth of tourism to the Canary Islands some caveats must be entered. The first of these is that the countries of the European Community (EC) (as noted above the source of the majority of tourists at present) have low demographic growth and ageing populations. (See Figure 3.1.6) Ageing populations may well exhibit a different propensity to travel and choice of destinations although as yet these hypotheses are untested. The second caveat is that tourism is a "fashion" industry, that is to say that destinations rise and fall in popularity in ways which may be independent of their intrinsic attraction or even their facilities. This means that tourism in the Canary Islands is not only affected by such factors as the GDP and propensity to travel in the originating countries but also by competition from alternative tourist destinations. In 1991 "fashion" probably worked in favour of the Canary Islands (perceived as a safe destination compared with the Eastern Mediterranean) there is no guarantee that "fashion" will continue to operate in favour of the Canary Islands.

3.2 Air Transport as an Economic Facilitator

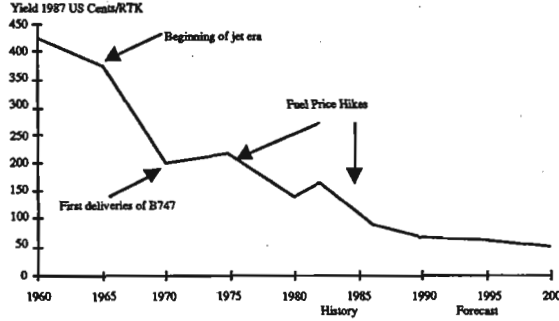
Air transport has been one of the main facilitators of economic development for the Canary Islands over the last thirty years. It is unlikely that reasonable living standards could have been maintained let alone improved without modern air transport placed at the disposal of the mass tourism markets generated by Northern Europe and peninsular Spain. To a lesser extent it has also permitted wider sale of the islands' primary products (horticulture and fisheries) and to some degree it has also allowed the smaller islands to participate in the tourism generated prosperity of the larger islands.

Figure 3.1.4
Relationship Between World GDP and Air Passengers/Freight 1988-1990



Source: International Air Transport Association (IATA)

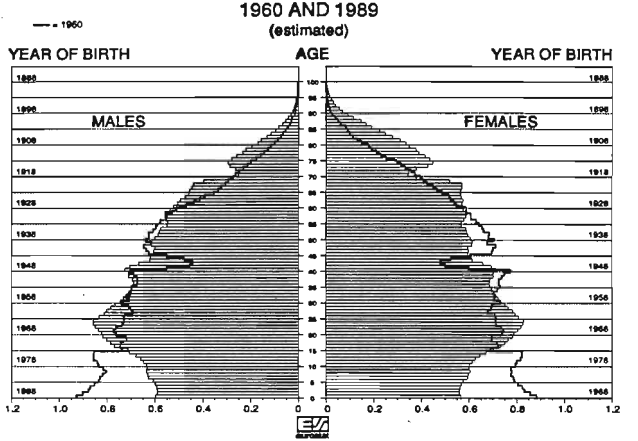
Figure 3.1.5
Trends in Air Fares 1960-2000



Source: IATA

Figure 3.1.6

Ageing Population by Country



Main demographic indicators for the European Community – 1988

Country	Population at 1/1/1989 (1 000)	Natural increase (1 000)	Net migration (1 000)	Total increase (1 000)	Gross marriage rate (per 1 000 inhabitants)	Total fertility rate	Infantile mortality rate (per 1 000 live births)	Life expectancy at birth 1985–86	
								Males	Females
BELGIUM	9927,6	+14	0	+14	6,0	1,54[1]	9,1	70,0[2]	76,8[2]
DENMARK	5129,8	0	+1	+1	6,3	1,56	7,8	71,8	77,6
FR of GERMANY	61715,0	−11	+486	+475	6,5	1,42	7,8	71,8	78,4
GREECE	10019,0	+16	+16	+32	4,8	1,52	11,0	72,6	77,6
SPAIN	38794,6	+97	−39	+58	5,6	1,36	8,1	73,1	79,6
FRANCE	56017,0	+246	+20	+266	4,9	1,82	7,8	71,8	80,0
IRELAND	3515,0	+22	−41	−19	5,1	2,17	9,2	71,0	76,7
ITALY	57504,7	+31	+65	+96	5,5	1,34	9,5	72,6	79,1
LUXEMBOURG	374,9	+1	+2	+3	5,5	1,51	8,7	70,6	77,9
NETHERLANDS	14805,2	+63	+35	+98	6,0	1,55	8,6	72,2	78,9
PORTUGAL	10305,3	+24	+11	+35	6,9	1,53	13,1	70,6	77,7
UNITED KINGDOM	57135,2	+139	−1	+138	6,9	1,84	9,0	71,7	77,5
EUR 12	325243,2	+643	+555	+1198	5,9	1,60*	8,5*	72,0*	78,6*

[1] 1986 [2] 1980

These economic benefits have not been secured without corresponding disadvantages. Arguably some of the negative effects of air transport have been:

- The encouragement of migration towards the principal islands and cities
- The facilitation of migration to peninsular Spain
- The over-development of some locations
- The "pollution" created by excessive tourism
- The impact of the airports on the local environment

Quantifying the last three of these is largely a value judgement for the local community. SRI's impression is that thus far low values have been placed on these impacts. Migration is another matter; numerous studies worldwide have illustrated the debilitating social and economic costs of large scale emigration particularly from island communities.

Average GDP per capita in the Canary Islands is approximately 75% of EC averages whilst Spain has now reached an average of 92% of EC levels. Differentials of these levels reduce much of the direct economic imperative to emigration. Nevertheless job creation is static and unemployment levels, particularly amongst young people, remain high. The GDP per capita differentials between the smaller islands and the larger ones are still at levels which encourage migration within the Canary Islands particularly of young adults. Finally it is worth noting that for most advanced vocational training, aspirants frequently have to reside in peninsular Spain for the duration of their course.

Air transport has a significant effect on employment and GDP within the islands. SRI estimates that 5,700 staff are directly employed by the airline and airport industry within the islands (see Figure 3.5.1 in Section 3.5). This indicates a direct contribution to the Canary Islands economy of some US$85 million. Using a conservative multiplier to allow for the additional GDP generated by airline industry jobs, the total immediate benefit of the airline industry to the Canary Islands is approximately US$ 240 million (as shown in Figure 3.5.1 in Section 3.5). These benefits accrue principally to Gran Canaria and Tenerife, which reflects their role as air hubs for the islands.

Improved air communications between the islands can have two distinct effects. On the one hand, if not accompanied by inward investment, it facilitates the movement of young adults from the smaller islands to the larger islands and can, therefore, cause the smaller islands to become economically dependent on the larger islands to an excessive degree. On the other hand, if supported by suitable inward investment (which is likely to be mainly associated with tourism), then improved air communications can stimulate the economic development of the smaller islands.

3.3 Future Economic Impacts

It is likely that further integration will improve economic growth and GDP per capita, particularly in the European core. In addition during the 1990s peninsular Spain and Portugal will probably continue to experience growth rates better than the West European norm. Leisure time will continue to increase with many countries achieving German levels. All this indicates that the Canary Islands' main tourism and business generating markets will continue to prosper and demand sea, sun and sand vacations and their supporting services.

With increasing affluence people generally place a higher value on leisure time. This will disadvantage those locations and destinations which are perceived to offer poor value in terms of time. SRI also hypothesises that ageing populations will place much higher values on convenience of travel and personal safety.

Northern European airport versus environment trends indicate a causal relationship between levels of personal affluence and sensitivity to the local impact of airport operation. It is likely that over the next ten to twenty years the Canary Islands will experience increasing sensitivity to the impact of airports. At present there are no significant property developments within the islands whose inhabitants are adversely affected by airport operations. However, in view of the general European trend it would be prudent to implement land use regulations in appropriate buffer zones around each airport.

3.4 Yields

Airline yields, or the average price paid per passenger kilometre[1], are also important determinants of the level of air travel. In Europe, yields vary greatly between scheduled and charter airlines, as well as among routes and between service levels first, business, economy. Because of the strong charter market, and the inability to separate easily the air fare component of many of the vacation packages data on charter airline yields are generally not available.

Data on yields for major European scheduled carriers are available and show a general decline in real yields since 1983. Before 1983, real yields were relatively stable, but did tend to increase during periods of high oil prices. Figure 3.4.1 shows trends in real airline yields, real European GDP, and passenger enplanements over the 1965 to 1990 period for The Association of European Airlines (AEA) airlines.

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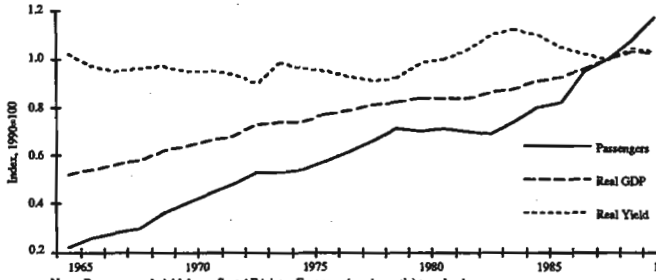
1 The sum of the products obtained by multiplying the number of revenue passengers carried on each flight stage by the flight stage distance.

Figure 3.4.1
Trends in European GDP, Airline Passengers and Yields 1965-1990



Note: Passenger and yield data reflect AEA intra-European (nondomestic) travel only
Sources: AEA, Wharton Econometrics

Airline yields are calculated by dividing the actual amount paid by passengers (net of airport and other taxes and irrespective of the published fare) by the total kilometres travelled. Yields, therefore, are a composite measure and can change even though published fares do not change. If, for example, more passengers opt for economy fares the yield goes down. Use of elasticities of demand with respect to fares and the cross elasticities of demand with respect to alternative fares (eg, first class, business, economy) is preferred to use of the elasticity of demand with respect to yields. However, fare data are not generally available on a consistent long-term basis whereas yield data are. The lack of fare data necessitate use of yields in determining the "price" elasticity of demand.

The AEA has estimated the effects of changes in yields on passenger enplanements. For scheduled international, intra-European air services, the estimated elasticity of demand with respect to real yields is -0.5, or, for every 10% decrease in real yields, the number of passengers increases by 5%. This elasticity estimate is consistent in magnitude to yield elasticities for air services used for business travellers developed by others. The elasticity of demand for leisure travel is generally much higher in absolute value than for business travel, indicating the greater sensitivity of leisure travel to price. For those routes in which leisure travel is a major share (eg all routes to/from the Canary Islands) elasticities of demand with respect to yield are likely to be greater than -1.0, although no firm estimates are available (thus for every 10% decrease in real yield the number of leisure travellers will increase by more than 10%).

Since the price elasticity of demand for leisure travel is high and since the overwhelming preponderance of international travellers to/from the Canary Islands are leisure travellers, it follows that the government has an interest in ensuring that the most efficient air carriers serve the Archipelago. Only low cost carriers who can operate profitably with low yields will be able to offer fare prices which stimulate demand and are motivated to provide the capacity to satisfy it. Three conclusions stem from this line of argument.

Firstly, the government must provide airport infrastructure (runways, apron stands, terminal facilities, access etc) suitable for the most efficient carriers' most efficient planes at all points to which it is wished to attract high volume tourism. Secondly, the government must (through the airport operators) market itself to the carrier as a profitable destination (although it is assumed that carriers always know their most profitable destinations, empirical evidence does not always support this view). The need to market the airports directly to the carriers will become even more evident as the importance of scheduled and/or seat only charters increases compared with IT traffic. Thirdly, the government must resist any moves designed to protect local, national or established carriers on the spurious grounds that this will protect jobs in the islands. This is simply not true. Jobs will only be protected by the attraction of leisure travellers who, as shown

above, are price sensitive consumers. They will therefore, travel only if the carriers offer acceptable levels of fares/frequency and service.

3.5 The Penalties of Inadequate Infrastructure

Inadequate infrastructure affects many stakeholder groups in the Canary Islands. They include the tourist industry, airlines, airports, air travellers, aviation employees, business and industry and the Government. The Canary Islands dependence on tourism means that airport constraints do not have to impact throughout the year to have serious consequences. They merely have to come into play at peak periods in order for the Canary Islands air transport infrastructure to be perceived as being congested.

The tourist industry is potentially the major affected group for the Canary Islands. The primary impact would be a loss of revenue from growth curtailed due to inadequate capacity (the opportunity cost). A more serious effect occurs when the higher yielding traffic switches to less constrained destinations. As congestion and delays become more acute then traffic can start to decline.

Inadequate airport and airway infrastructure affects the airlines most visibly by delays. Over time not only will the resultant increase in their costs and decline in route profitability lead to increases in fares but also, in a liberalised air transport market tend to decrease the frequency of service to those destinations with the worst delays. As air traffic volumes approach or exceed an airport's or airspace's maximum capacity, growth in air traffic drops.

Airport revenue losses occur as a result of the reduced growth in aircraft movements and increased costs associated with providing facilities to serve increasing numbers of passengers per aircraft. If congestion is severe enough to slow the growth in passenger traffic, or divert it to another airport, then airport revenues from tenant sales or lease payments will be even further reduced.

Air travellers are directly and adversely affected by delays and/or excessive processing times (check-in, baggage retrieval, hotel to airport journey times etc). These losses manifest themselves as wasted time, lower productivity, higher than necessary ticket costs when airlines pass on the increased costs associated with these quantifiable impacts, as well as the inconvenience and disruptions of unexpected changes in travel plans.

Local employment losses arise as a result of curtailed growth, and in a situation of high local unemployment, reduced air travel growth results in quantifiable losses to airline, airport and other employment.

Losses to business and industry are often difficult to quantify but in the case of the Canary Islands, wbere most of the economic activity is tourism based, it is safe to assume that any constraint which results in the curtailment or reduction of tourist numbers will have direct equivalent effects on local GDP.

The current economic impacts have been considered under three types. These are direct, indirect and induced impacts.

Direct impacts on the Canary Islands commercial aviation services arise through airline (passenger and cargo), airport and Canary Islands based government civil aviation activities. Using data supplied by the airports, airlines and other sources SRI estimates that the total direct Canary Islands impacts are annual operating expenditures of some $85 million and almost 5,700 jobs.

Indirect impacts on the Canary Islands commercial aviation arise in a variety of commercial and economic activities closely allied to the use of commercial aviation services. Activities include such items as taxi and coach services to and from the airports, airport based rental car activities, travel couriers, air freight forwarders etc. SRI has deliberately excluded hotels, restaurants and other elements of the tourist industry from this category and will discuss separately. SRI conservatively estimates that one indirect job is created for every two direct and that the annual expenditures per job will be two thirds that of direct activities. The estimates are that the total indirect impacts amount to annual operating expenditures of some $28 million and almost 2,900 jobs. See Figure 3.5.1.

Induced impacts arise from subsequent expenditures or the investment of direct and indirect revenues or incomes as airlines, airports and employees in turn purchase goods and services from others in the economy. The multiplier that applies to each industry is unique and varies by local economy. Studies in the United States indicate an economic multiplier of 205% for aviation at the national level. That is, for every $1.00 the aviation industry spends, an additional $2.05 in economic activity is created. Other studies indicate that at the local level the additional economic activity created for every dollar spent is $1.70. The lower value reflects a faster "leakage" of the initial dollar out of the local economy. SRI has used a conservative multiplier of $1.125 as the estimate for the induced economic activity for each direct and indirect dollar spent by the commercial aviation industry in the Canary Islands. SRI estimates that the total induced impacts for the Canary Islands amount to annual expenditures of some $128 million and almost 17,000 jobs.

Figure 3.5.1
Total Impact of Commercial Aviation-Related Activities

	Direct		Indirect		Induced		Total	
Island	Employment	Expenditures $000's	Employment	Expenditures $000's	Employment	Expenditures $000's	Employment	Expenditures $000's
Gran Canaria	2,500	37,500	1,250	12,500	7,500	56,250	11,250	106,250
Lanzarote	450	6,750	225	2,250	1,350	10,125	2,025	19,125
Tenerife	2,082	31,230	1,041	10,410	6,246	46,845	9,369	88,485
La Palma	231	3,465	116	1,155	693	5,198	1,040	9,818
Hierro	75	1,125	38	375	225	1,688	338	3,188
Fuerteventura	356	5,340	178	1,780	1,068	8,010	1,602	15,130
TOTAL	5,694	85,410	2,847	28,470	17,082	128,115	25,623	241,995

The direct, indirect and induced effects of commercial aviation in the Canary Islands are widespread and highly significant, contributing $242 million to the local economy, while generating close to 26,000 jobs (5700+2900+17000). The benefits are not evenly spread across all the islands but are skewed towards Gran Canaria and Tenerife which in part reflects their role as aviation hubs.

As mentioned above air transport is the key facilitator for the Canary Islands tourist industry. In 1989 this industry was responsible for 72% of GDP and 306,000 jobs Since 1980 Canary Islands' air transport and consequent employment has grown at 6 to 8% per annum. Constraints will jeopardise this growth rate and could mean that upwards of 2000 new jobs and US$19 millions of additional expenditures per annum will be lost to the Canary Islands economy. The capital costs of overcoming the identified restrictions are such that payback periods are less than two to three years just on a consideration of the air transport impacts.

In addition the possible effect of constrained air transport on the Canary Islands tourist industry is so substantial that no risk should be taken with this key industry. The inefficiency cost of some degree of over-supply is far less than the risk weighted revenue losses for constraint impacted tourism.

In preceding sections of this report SRI has identified the constrained portions of the air transport infrastructure. Today these are the terminal service arrangements at Fuertenventura, Gran Canaria, Lanzarote and Tenerife Sur and the ATC acceptance rates across Casablanca FIR. SRI's analysis has further concluded that portions of five airports will be constrained during peak periods by 1995.

In the absence of action further constraints will come into effect as illustrated in Figure 3.5.2.

Figure 3.5.2
Year in Which Various Capacity Elements Might be Constraints at Various Canary Islands Airports

	AIRPORT																	
	Fuerteventura			Gran Canaria			Hierro			La Palma			Lanzarote			Tenerife Norte			Tenerife Sur		
CONSTRAINTS	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H	L	B	H
Runway Configuration					2003	1998								2005			2010	2003		2003	1998
Taxiways/Exits	2007	1998	1996		2001	1997			2005		1998	1995		2002	1998	1992	→			1992	→
Terminal Capacity	2010	1999	1996		2002	1998					2007	2002		2004			2004		1992	→	
Terminal Facilities	1992	→		1992	→								1992	→						1992	→
Apron Capacity	1992	→															2005	2000		2000	1998
Landside	1992	→		1992	→																

Note: The above table was prepared using information made available to SRI during the course of the study

4. AIR TRANSPORT REQUIREMENTS OF THE CANARY ISLANDS 1990-2010

The study specifically excluded a formal demand forecast for air travel within and to/from the Canary Islands. However it did include a review of key demand determinants and trends.

4.1 European Air Travel

Traffic Growth

European air travel has grown rapidly over the past twenty years, reaching over 206 million passengers in 1990.

This growth continued in 1990 when the airlines belonging to AEA recorded scheduled air traffic growth of no less than 12% for the period of January-August (9% for the year overall, Figure 4.1.1).

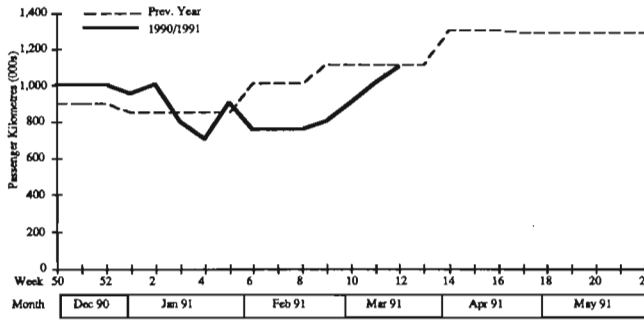
Growth in individual country markets in 1990 was unevenly distributed with traffic to/from Italy achieving the largest increase of 15%. Within Southern Europe; Portugal, Yugoslavia and Spain also saw above average growth while Greece and Turkey increased only marginally. Substantial developments also occurred in the German and Austrian markets. The fastest growing markets were Finland, Ireland, Portugal.

During the last four months of 1990, the growth rate was halved as the weakening economic situation and the threat of war in the Middle East began to impact the travel market. In the second half of January 1991, and throughout February, passenger boardings were running well below 1990 levels with shortfalls of about 25% on European routes.

Despite the setbacks due to the Gulf war and recession it is expected that future growth will soon resume the pattern established in the 1970s and 1980s. This is due to a combination of factors, including increasing real incomes in Europe (and those countries providing most of Europe's intercontinental visitors - USA, Japan, Canada and Australia) together with trends towards liberalisation, greater leisure time and greater mobility.

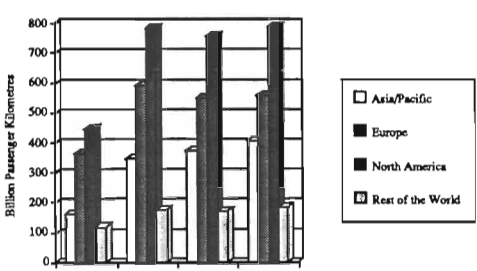
Latest forecasts indicate that early 1990 traffic levels will be regained in the second half of 1992. (Figure 4.1.2)

Figure 4.1.1
European Passenger Kilometres (000)



Source: AEA

Figure 4.1.2
Timetable for Recovery



Source: ICAO/SRI

4.2 European Air Transport Regulation

Air Traffic requirements of the Canary Islands can be considered under two headings, tourism and inter-island/domestic. Since the vast majority of tourists originate within the EC or countries which may be expected to join the EC or participate in the EC air transport management regime within the timeframe under consideration the regulatory environment for both types of traffic can be considered as one.

Bilateral Agreements

Although Air Service Agreements and Bilaterals are, ostensibly, negotiated between Governments, for many years they were, de facto, negotiated between airlines. Where the airlines in question were government owned (the majority of non-US flag carriers) the resultant negotiations tended to regulate fares and capacity (aircraft types, frequency etc) and did little to stimulate competition. At the same time IATA rules specified the levels of cabin services offered by its members (most non-US flag carriers). The result was markets which offered little competition in terms of service and/or fares (which were set at a level to protect the least efficient carrier).

Privatisation and the emergence of a more commercial attitude in even the still state-owned carriers, the collapse of the IATA restraints on competition and the emergence of pan-EC liberalisation are effectively eliminating bilateral agreements as a significant factor in intra-EC air traffic.

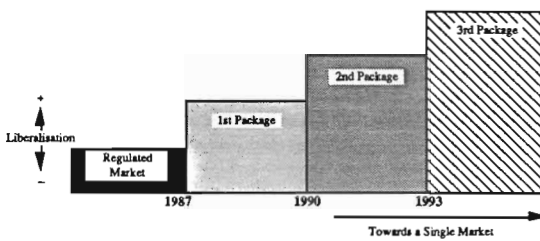
EC Liberalisation

Deregulation has already been mentioned as one of the drivers of air travel growth and although Europe is moving cautiously in this direction, there is little doubt that air policy liberalisation will be a major influence on the pattern of growth of European air transport in the 1990s.

Liberalisation within the EC has centred around three areas of policy: capacity, pricing and market access (Figure 4.2.1). This policy will provide a transition from the closely regulated environment pertaining before 1987 to a fairly liberal environment from 1993 when the third aviation package is implemented.

Latest reports from the EC indicate that the principal consequence of the third aviation package will not be to facilitate the emergence of more carriers, but to create more opportunities for existing carriers, permitting them in certain circumstances to operate more services than today wherever they want in the community. It is likely that charter airlines will be allowed to

Figure 4.2.1
Towards 1993 - A Step-by-Step Approach to Liberalisation



Source: AEA

operate as scheduled carriers provided that they meet EC scheduled operator quality standards on such matters as finances, insurance and licenses.

Discrimination by national governments between air carriers operating in a member state and air carriers established in that same state will not be permitted. It is intended that all member state carriers would eventually have "fifth freedom rights"[2] across the community. Full cabotage rights will not take effect on January 1, 1993, instead there will be "consecutive cabotage"[3]. The aim of the Commission is to introduce the changes gradually to allow airlines to adjust without their survival being threatened. Proposals on fares are still being negotiated but one principal seems to be agreed, namely that next year intra-EC fares will be governed by a "single approval"[4] rule. This should bring into operation more fare flexibility and new services.

Where liberalisation has already been achieved in Europe eg UK-Eire and UK-Netherlands, the results in terms of the volume of traffic, fare levels and the choice available to the consumer have been significant. In the case of the UK-Eire market (where liberalisation occurred progressively in 1986/1988), the number of services from Dublin to points in the UK rose from 30 to 70 per day between 1984 and 1989 and the number of passengers more than doubled. (Figure 4.2.2). On the key Dublin-London route, traffic increased by 140%. One interesting side effect was that the average aircraft capacity declined slightly (Figure 4.2.3) as carriers used frequency as a prime competitive factor. The original duopoly of carriers (Aer Lingus and British Airways) was supplemented by three newcomers (British Midland, Dan-Air and Ryanair) before reducing to three (Aer Lingus, British Midland and Ryanair).

What lies beyond 1993 is not yet clear. What seems most likely is that with the anticipated broadening of the EC and already expressed desire of the European Free Trade Area (EFTA) countries to participate in the EC air transport management regime, the geographic area throughout which liberalisation applies will steadily expand.

4.3 Scheduling in a Congested Continent

With 16 leading European airports already heavily congested at peak periods and many more airports expected to be severely constrained by the year 2000, scheduling has already become a major problem for airlines flying into and within Europe.

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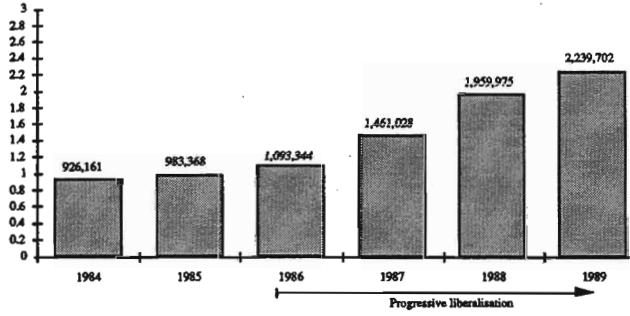
2 Fifth freedom rights would allow an airline to fly from its home country to a second country discharge and collect passengers, and proceed to a third country. For example, Iberia would be permitted to fly from Madrid to Frankfurt, discharge and collect passengers, and then fly on to London.

3 Consecutive cabotage would permit an airline to fly from its home country to another member state discharging and picking up passengers at one destination within that member state and then proceed to another destination in that member state. For example, Alitalia would be permitted to fly from Milan to Barcelona, discharge and pick up passengers, and then continue on Malaga.

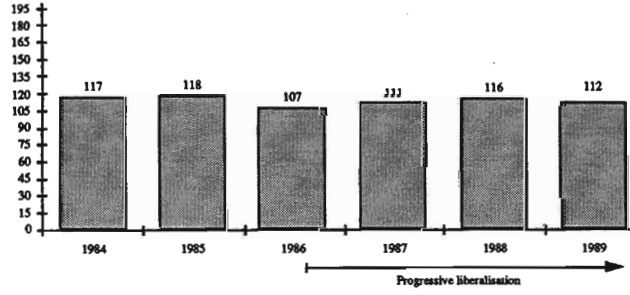
4 An EC airline will be able to introduce a fare for a route between two EC countries with simply the approval of its' own government and not both governments as before. It should be noted however that some member states want safeguards to protect their flag carriers.

Figure 4.2.2
Dublin/London
Total Passengers 1984-1989 (millions)



Source: Aer Rianta/SRI

Figure 4.2.3
Dublin/London
Average Aircraft Capacity 1984-1989



Source: Aer Rianta/SRI

Trying to satisfy consumer preferences for airport, departure and arrival times while maintaining acceptable levels of utilisation and efficiency for aircraft and crews of the airlines serving airports such as London Heathrow becomes a difficult planning exercise followed by a problematic implementation phase. Moreover, the impact of the problem (which is exacerbated by the existence of curfews) at the congested airports spreads to all other airports served by the affected carriers. To address this challenge the airlines, under the aegis of IATA, have evolved a system where they meet regularly to discuss schedules. The main objective is to allocate the available landing and take off slots between the existing carriers.

How the System Works:

Schedule Coordination Conferences, in which any airline may participate if registered in a State eligible for membership in ICAO, are held twice each year about four months before the start of the summer and winter scheduling seasons. Airport capacity limitations applicable for the season under discussion are declared before the Conferences by the appropriate authorities in consultation with airlines. A Coordinator, usually a national airline is appointed by the airlines or authorities for each constrained airport. About three weeks before each Conference, airlines provide Coordinators with schedule clearance requests for the arrival and departure times required at the airport concerned. The Coordinator collates this information and identifies periods in which slot requests exceed declared airport capacities. Airlines with requests which are regarded as having lower priority are offered the nearest alternative timings available at the commencement of each Conference, and demand is thus reduced to match capacity.

During the Conference, schedules are adjusted mainly through bilateral discussions between airlines and Coordinators regarding alternatives offered, or between airlines to exchange slots offered or accepted. A schedule change at one airport must affect one or more other airports. Because all Coordinators attend the Conference, it provides the best forum in which all such repercussive changes can be quickly and efficiently processed, and airlines can leave the conference with firm schedules which they consider are the best compromise between what is wanted and what is available.

Although these conferences have, to date, enabled the dilemma facing the existing operators to be satisfied, they have been strongly criticised because of the formidable barriers to entry they represent to new entrant operators and the restrictions to growth they impose on the efficient and ambitious carriers.

Various proposals have been made by the EC and national governments but none have been accepted. Increasingly airports are demanding a say in the ownership and allocation of slots.

4.4 Air Traffic Control

ATC Infrastructure

The Chicago convention of 1948, which established many of the general international aviation bodies and the international rules which underpin air operations, agreed that the air space over a country's territorial limits was sovereign. It also divided up much of the world's air space into

Flight Information Regions (FIR).[5] These FIRs were assigned to individual countries and their successors to manage.

The Canary Islands' FIR is one of three covering Spanish airspace and is a linchpin for services to/from Europe, Latin America and Africa. The ATC centre for the Canary Islands' FIR is adjacent to Las Palmas airport. An upgrading of facilities is currently underway which will bring the Control Centre up to the highest European standards.

Unfortunately the adjacent Casablanca, Dakar and Cape Verde FIR's have serious technology and service shortcomings. The Casablanca FIR acceptance rate[6] is a significant constraint on the main traffic flows to/from and en route over the Canary Islands and as technology is developing in the Canary Islands, the relative situation will worsen.

Air traffic space within the Canary Islands' FIR is divided into two; a terminal manouvering area (TMA)[7] which covers the islands, and the rest of the FIR.

To even out the air traffic management workload, the FIR is divided into seven sectors[8]. Six sub-divide the TMA and the the seventh sector covers the remainder of the FIR. The seven sectors are not always independently active; depending on anticipated air traffic loadings and staff availability the sectors may either individually be active or they may be combined with other sectors.

Full coverage is provided for all commercial air traffic movements within the FIR which also includes the old province of Spanish Sahara with its three airports of Laâyoune, Ad Dakhla and Nouadhibou. In 1975 Spanish Sahara was annexed by Morocco after evacuation by Spain. A guerilla war is currently being fought between Morocco and the Polisaro over the territory's future.

The airspace is still managed by the Canary Islands' FIR. It may be, that on settlement of the territory's sovereignty, a deal could be arranged whereby the Canary Islands' FIR relinquishes management of air space over the Spanish Sahara to Casablanca but takes over the Canary Islands en route portions of Casablanca FIR.

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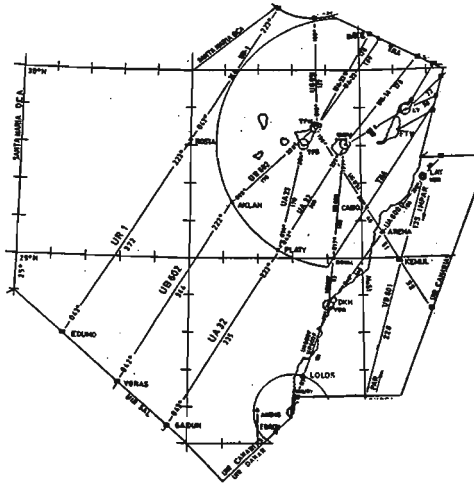
5 FIRs are managed by a country. Over land FIR boundaries are coincident with national boundaries. Over ocean, although assigned to a country, they are not coincident with sovereign air space.

6 Acceptance rates on routes into an FIR are largely dependent on the technology available to the air traffic controllers. Casablanca requires aircraft to maintain 10 minute separations. Typical European separations are between 5 and 10 nautical miles (for a jet aircraft 1 to 2 minutes). In traffic flow terms the whole flow has to move at the rate imposed by the maximum separation standards en route.

7 Blocks of airspace designed to protect groups of adjacent aerodromes and major intersections of airways.

8 Sectors are blocks of airspace suitable for assignment to a controller(s).

Figure 4.4.1
Terminal Manouvering Area (TMA)



On field tower services are provided at the seven commercial Canary Islands' airports: Fuerteventura, Gran Canaria, Hierro, La Palma, Lanzarote, Tenerife Norte and Tenerife Sur.

Dedicated approach control is provided at Gran Canaria, Tenerife Norte and Tenerife Sur. In the case of the last two, approach control is located at the respective field control towers but these approach controllers will eventually be sited at the Las Palmas centre.

There is also a general aviation airport at Beriel (Aeroclub de Gran Canaria), Gran Canaria. All navigation aids at this airport are the responsibility of the airport operator.

Navigation aids and their sitings are listed below.

Airport-based Navigation Aids in the Canary Islands

Navigational Aids \ Airport	GCLP	GCRR	GCTS	GCXO	GCFV	GCHI	GCLA
Approach radar	2		1			1	
VORs	2	2	1	1	1		
Locators	3	1	1	2	1	1	1
ILS	2	1	1	1			
DME	2	1	1	1		1	1

Approach Radar	An aid permitting approach under the direction of a radar controller.
Very high frequency, omnidirectional range(VORs)	A flow altitude system consisting of airways from 1200 ft above the surface up to, but not including, 18,000 ft above mean sea level.
Locators	Used as an aid to final approach. A locator would usually have an average radius of rated coverage of between 18.5 and 46.3 km (10 and 25 nautical miles).
Instrument Landing System (ILS)	An approach and landing aid designed to identify an approach path for exact alignment and descent of an aircraft making a landing.
Distance Measuring Equipment (DME)	Primarily serving operational needs of en-route or TMA navigation

In addition there are three en route radars, two at Gran Canaria and one at Hierro.

The Canary Islands' FIR is fully integrated into the European-wide traffic flow management arrangements and reports through the traffic flow unit located in Madrid. In 1995 the Madrid unit function will be integrated into the new traffic management centre being set up in Belgium and the Canary Islands will coordinate with this centre. Casablanca FIR is not part of the arrangements to maximise the use of European air space and those flights (the majority) via Casablanca FIR will still be subject to the restrictions discussed above. A working group with members from Algeria, France, Morocco, Portugal and Spain has been established to address issues such as these. One of the points which will be addressed is the inclusion of Morocco in the European Flow Management System. (Canary Islands' ATC have offered to assist in this.)

Air Traffic Movements

Air traffic movements within the Canary Islands have nearly doubled during the period of 1982-1991 and early indications are that 1992 will be another year of very strong growth. All types of movement have grown substantially over the period with extra strong growth occurring in inter-island traffic since 1989 (after establishment of Binter Canarias),and the en route traffic. Of the total movements, 65% are between the Canary Islands, mainland Spain or the rest of Europe, 20% are inter-island with the remainder consisting of overflights and military movements. General does not generate significant movements. (Figures 4.4.2, 4.4.3 and 4.4.4)

International and peninsular Spanish traffic shows marked seasonality with strong peaks at Easter, Christmas and during August. Throughout the year there are variations in the density of traffic during the week at each airport. The peak and heavy days for traffic at the four main airports are shown below.

	Mon	Tues	Wed	Thur	Fri	Sat	Sun
Fuerteventura	P					H	
Lanzarote	P					H	
Gran Canaria	H		H			P	
Tenerife Sur					P	H	H

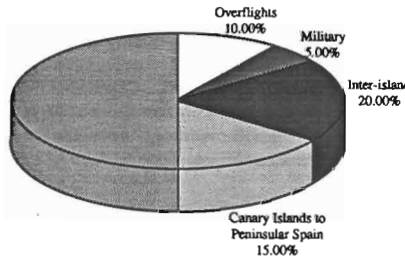
H= Heavy Day P= Peak Day

SRI and the Centro de Control de Transito Aereo del Area de Canarias (CCA) estimate that given the current level of air movement growth and in the absence of new routes and/or improvement to Casablanca FIR acceptance rates, substantial peak day ATC delays during the Easter, August and Christmas seasons will be experienced from 1994 . The new routes and trunk routes planned for June 1993 will alleviate the situation but are not a long term solution.

The growth of inter-island traffic with its East-West axis of operation and ceiling of around 12,000 feet taken together with the North-South axis of most arriving and departing traffic has complicated air traffic management within the Canary Islands' TMA. It has also re-emphasised the major short coming of the TMA, namely a radar blind spot below 12,000 feet West of Tenerife.

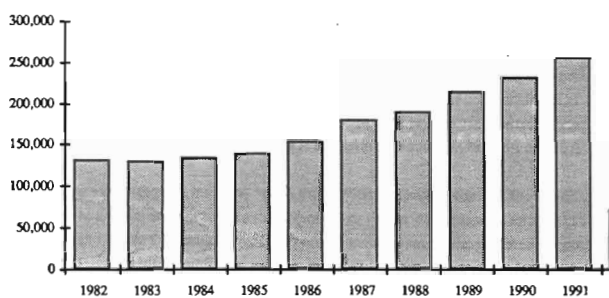
The blind spot arises because of the siting of the long range radars servicing the FIR and the topography of the islands. The two principal radars are sited high on the central massifs of Gran Canaria and Lanzarote. Their radial range is over 200 nantical miles. Nevertheless, the Tiede massif on Tenerife blocks the "view" of these radars of the majority of the airspace below 12,000 feet above Hierro, Gomera and La Palma.

Figure 4.4..2
Distribution of Traffic Movements



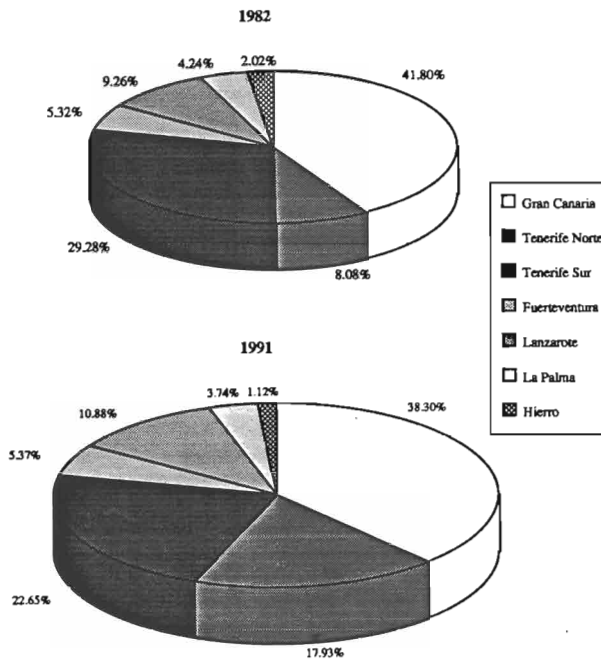
Source: CCA/SRI

Figure 4.4.3
Aircraft Movements 1982 - 1992



Source: CCA/SRI

Figure 4.4.4
Aircraft Movements by Airport



Source: CCA/SRI

In addition to the safety implications, this lack of radar coverage will impose constraints on the ultimate capacity and operation of the airports of Hierro and La Palma. It will also greatly complicate the safe operation of the new airport under construction in Gomera.

Plans exist and funds have been allocated to provide the necessary cover by siting another long range radar on Hierro with a new secondary radar on the west side of Tenerife. The siting on Hierro has been blocked by local opposition. Until the situation is resolved additional radars will be sited on the island of La Palma, but this is not the best solution.

Telecommunication links between facilities on the various islands are through a mix of dedicated, normal and "hot" telephone lines. Links with Casablanca and Dakar FIR's are through normal telephone lines and are poor. The military are installing microwave communication network links between the islands; these will be used by ATC and provide excellent back up. Air to ground communications are excellent with several backups in operation and planned.

The future general telecommunication needs of the islands might justify investment in satellite technology. This would be an excellent move from an ATC point of view and given such developments as Global Positioning of aircraft by satellite and other air to ground to satellite technologies, may be a means of overcoming the Casablanca FIR situation and the radar blind spot mentioned above.

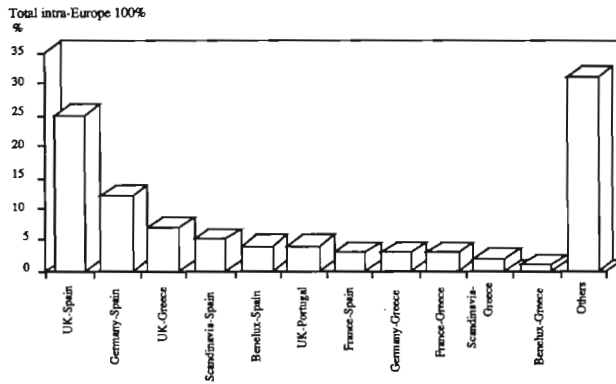
Finally, it is worth noting that the Canary Islands FIR ATC centre is an advanced technology resource which could play a greater role in the development of the islands. For example, few Canary Islands' residents train as ATC controllers, partly because of the need for extensive training on peninsular Spain - training which could be provided at the centre. Moreover, the common use of inter-island satellite links with the PTT could make such links viable much sooner than would otherwise be the case.

4.5 Travel and Tourism

Charter airlines in Europe have been at the heart of the growth of European leisure travel with the traditional market being the annual holiday migration of North Europeans to the Mediterranean. The largest flows have been from the UK and Germany to Spain with Scandinavia and the Benelux countries as second order producers (Figure 4.5.1).

Whilst the range of destinations has increased, Spain remains the principal holiday destination. Over the years Portugal, Cyprus, Greece and its islands and, most recently Turkey have become major destinations. Smaller, but still significant, flows have developed to more exotic destinations around the fringes and just beyond the Mediterranean, such as the Canary Islands, Israel and North Africa. Often these have a particularly strong seasonal demand.

Figure 4.5.1
Index of major European Charter Traffic Flows 1990



Source: EIU/SRI

In recent years, the Mediterranean countries have also began to generate traffic, chiefly towards Northern Europe for holiday, educational and visiting friends and relatives (VFR) purposes.

More recently, charter operators have been carrying passengers to more distant destinations with principal points being Florida and the US West Coast and the Far East, especially Thailand. Other charter destinations around the world are Kenya and islands in the Indian Ocean, Mexico and Australia. In all cases Germany and the UK are the principal traffic generators.

Traditionally, charter airlines have carried Northern European holiday makers on package tours. This is still a prominent feature of the market but there is a growing independent segment, associated with time share and similar arrangements (seat only charters). Independent travel is also a feature of transatlantic charter flying from Europe. (Figure 4.5.2)

The European independent outbound travel market accounts for an estimated 70 million trips per year at least with IT packages accounting for about 34% of the 200 million leisure trips made by West Europeans in 1990.

In 1989 a study by the Netherlands' Board of Tourism identified the following future trends among European travellers:

Markets	North West European Markets	Central & South European
New Prime Destinations	Far East North America	Far East North America
New types of holiday	City short breaks Second home abroad Action/Sport	Health Education

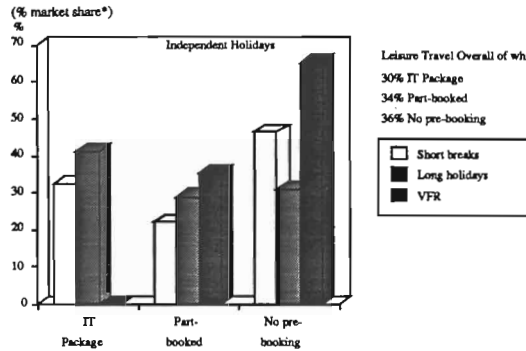
Source: EIU

European airlines are likely to show a significant growth in the long haul and short breaks markets. By 1990 AEA airlines had already expanded their long haul destinations to a total of 176 cities outside Europe.

Changes in the EC regulatory scene have caused Europe's charter airlines to re-evaluate their strategies. On the one hand they are presented with threats as developments among national scheduled operators put pressure on their business. On the other hand, there are opportunities in a liberalised scheduled air transport market. It is likely that some, if not all, will transform themselves into low cost scheduled operators.

Figure 4.5.2

European outbound leisure travel 1990



*Totals may not add due to rounding
Source: EIU/SRI

4.6 Cargo

Air cargo traffic development (scheduled, charter, express, parcel and mail) is closely related to the world economy and after several years of rapid growth, the air cargo growth pattern remains high despite a fall off in GNP growth (Figure 4.6.1).

Although there is a growing demand for pure freight aircraft, the majority of air cargo is transported in the holds of passenger transport aircraft. Dedicated freight aircraft are largely confined to the transportation of oversized loads, livestock, parcel traffic and the service of high volume freight markets and remote destinations.

Even with the slowing of several of the world's major economies, world scheduled cargo traffic grew an estimated 7% in 1990. The reduction in cargo traffic growth in 1990 was partly due to the restricted freight capacity caused by the decline in passenger traffic, which caused many flights to be cancelled. This situation was compounded by the extensive use of civilian aircraft in support of Operation Desert Storm.

Cargo traffic during the next two decades is forecast to grow at an annual rate of 8.5%. Future growth will be driven by several factors:

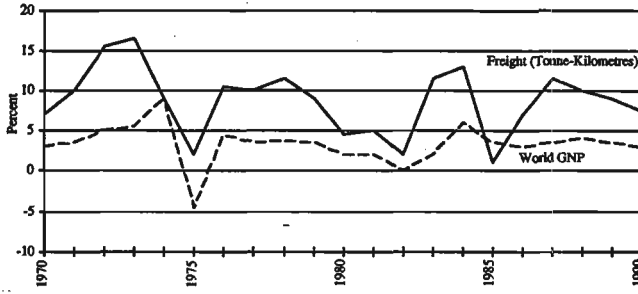
- Fewer trade barriers as a result of new bilateral agreements
- The further development of small-package express delivery systems
- The extension of of just in time manufacturing systems
- The greater ability of manufacturers to diversify production across borders.

With regard to air cargo traffic in respect to the Canary Islands, five distinct flows need to be analysed:

- Inter-islands
- Peninsular Spain to Gran Canaria and Tenerife
- Gran Canaria and Tenerife to peninsular Spain
- Direct non-Spanish imports
- Exports

The first of these flows is discussed in the context of inter-island air transport see Section 4.7 Inter-Island Air Transport.

Figure 4.6.1
Cargo Traffic and Economic Growth



Source: Airbus

The peninsular Spain to Gran Canaria/Tenerife cargo flow will, in general, be of the same nature as inter-island traffic ie high value/low weight items of which a significant proportion will be transhipped to inter-island services. As with inter-island services the nature of the material transported makes the efficiency (ie speed and user-friendliness) at least as important as price in determining success.

The reverse flow, from Gran Canaria/Tenerife to peninsular Spain, carries limited volumes of high value/low weight items eg equipment being shipped for repair, together with potentially significant volumes of island produce (especially horticultural produce and fisheries). Both outward and reverse freight flows, like inter-island routes, include major quantities of mail.

The development of direct air passenger services from other countries into the Canary Islands has not been accompanied by growth in direct air freight movements. This has been due to the legislative framework which has effectively prevented the charter airlines marketing the freight capacity of their passenger aircraft. Changes in the legislative environment may enable what are currently designated as (passenger) charter airlines to compete in this market from 1993 or some later date. If so, it should be of benefit to the Canary Islands through the provision of potentially faster and direct freight services from the industrial centres of Northern Europe to the islands (ie without the need for transhipment in Madrid). Moreover, the increasing use of widebody aircraft by the charter airlines would permit the use of larger containers.

The final freight market which must be considered is that for the export of the Canary Islands produce (mainly horticultural and fisheries) to non-Spanish destinations. Here, the belly freight capacity of (passenger) charter airliners (as noted above, increasingly of the widebody variety) offers a ready-made channel when the legislative environment permits. Indeed this media is already used to some extent under the existing monopoly since Iberia sub-contract an element of actual transportation to charter airlines.

The existence of air transport service is not, however, of itself sufficient to provide an effective air freight service between the Canary Islands and the Northern European markets which can provide outlets for the islands high quality horticultural and fisheries produce and products. It is also essential that the air links themselves are supported by suitable ground facilities at the airports, efficient transportation from the point of origin to the airport (which may require multi-modal transport systems), suitable packing/preparation facilities and, perhaps above all, simple documentation and rapid documentation processing.

The development of the Canary Islands horticultural and fisheries industry is, of course, beyond the scope of this study but it should be noted that in the existing air links the islands have one of the major facilitating factors for the marked expansion of this industry.

4.7 Inter-Island Air Transport

Inter-island air transport is currently dominated by Iberia through its wholly owned subsidiary *Binter Canarias SA*. Until 1989 inter-island traffic was serviced directly by Iberia. Some charter operators are permitted to service two centre package holidays by picking up passengers on one island and disembarking on another, but this is not a significant traffic flow.

Binter Canarias, the principal scheduled inter-island operator in the Canary Islands was established in 1989 and carried some 2.1 million passengers on inter-island journeys in 1991. The major portion of its' passengers (90%) are residents of the Canary Islands with around 40% making trips for business reasons (Figure 4.7.1).

Binter Canarias was established to provide inter-island air services within the Canary Islands with the objective to provide, through the use of locally based turboprop aircraft, a more suitable and cost effective solution to the requirements for inter-island transport in the Archipelago. (At the same time Binter Mediterranea was also established with a similar remit to provide services within the Spanish Mediterranean islands).

In 1989 Binter Canarias' revenue was 21.92 US cents per Revenue Passenger Kilometre (RPK). This was about the average for a selection of worldwide regional airlines as can be seen from *Figure 4.6.2.*

In 1989 Binter Canarias' cost per Available Passenger Kilometre[9] (APK) was reported in Airline Finance and Traffic as 28.67 US cents per APK, which is high compared to analogous regional airline operations (as shown in Figure 4.7.2). Binter Canarias states that costs have been reduced by approximately 4.5 US cents per APK over the last three years. This new level of cost is still in the high range compared with carriers in Europe and the United States. Binter Canarias needs to reduce its costs by a further 12 to 14 US cents per APK (ie a further cost reduction of approximately 50%) in order to compete as a low cost producer by the time that the impact of European liberalisation reaches the Canary Islands inter-island air transport market (probably around 1995/6)[10].

Binter Canarias has made operating losses since its inception although load factors have been consistently high (averaging in excess of 65%). It is unrealistic to consider an average load factor in excess of 75% although this would in any case still leave Binter Canarias with operating losses given current revenue and cost levels.

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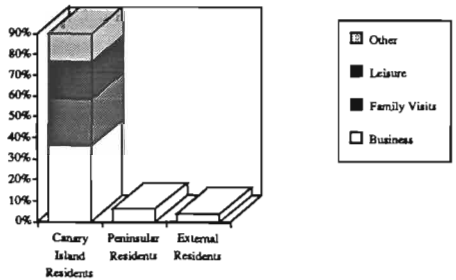
9 The total number of seats available for the transportation of revenue passengers multiplied by the number of kilometres which those seats have flown

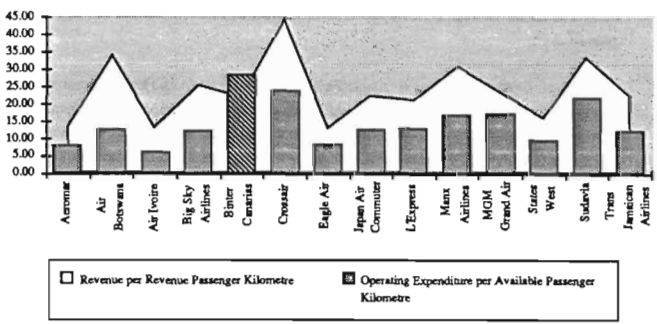
10 The ways in which the full impact of liberalisation on regional activities such as Binter Canarias will be tempered is not yet known. Although EC policy is likely to be sympathetic towards "remote" regions such as the Canary Islands, the Scottish Islands etc., it is safer to assume that operators in these areas will at some stage, be exposed to the full rigour of competition even if extended transition periods are granted.

Figure 4.7.1
Passengers by Domicile and Reason for Travel



Source: Binter Canarias/SRI

Figure 4.7.2



Source: *Airline Finance and Traffic/SRI*

Taxation supported subventions cover a portion of the operating losses. The inter-island direct subsidies are less than they might be because of limited take up of the Canary Islands residents scheme. (The scheme requires residents to obtain a certificate to prove residency at the relatively high cost of approximately 200 Ptas.) On production of the residency certificate a passenger receives a 10% discount on the fare, the discount is then reimbursed to Binter Canarias by the Autonomous Government.

The extent and level to which these subventions will continue to be permitted under the new EC air transport management regime and consequent impact on the Canary Islands is presently unknown. Indeed it is not even clear the degree to which EC air transport proposals will be implemented in regard to inter-island air traffic. It is possible to envisage a situation where entry into this market is totally open to all EC carriers, including many currently designated as charter operators. Under this scenario it is essential that Binter Canarias becomes a low cost producer as rapidly as possible.

There are proposals to levy airport charges on all arriving and departing passengers. If implemented these charges could have significant effects on the usage of inter-island air services especially by the non business users (60% of the market) given the likely elasticities of demand. A significant flat rate charge could affect the demand supply relationships to the extent that additional government subventions to maintain services would equal or exceed the revenue gained from the new airport levies per passenger.

The main infrastructure constraint to inter-island air traffic for business travellers is probably the availability of cheap, secure, short and long term private car parking at the two inter-island hubs (Las Palmas and Tenerife Norte). Taxis are a partial answer but their charges for Las Palmas and Tenerife Norte can be of the same order of magnitude as the inter-island air fares.

Other inter-island transport services include ferries between all the islands and jet foil services between Gran Canaria, Tenerife and Fuerteventura. On these city pairs the jet foil is the prime competitor to air transport but is more expensive.

Inter-island air cargo typically consists of urgent or high value/low weight deliveries and mail from Tenerife and Gran Canaria to the other islands. There are minimal air cargo flows back to Gran Canaria and Tenerife. The prime competitors are the well established sea services with rates that can be one-quarter to one-half of the lowest comparable air cargo charges. Increasingly, for regular inter-island deliveries, distributors are making use of high quality door-to-door services utilising roll-on roll-off ferry links and dedicated trailers.

The key objective for inter-island air travel services must be to reduce costs to levels prevailing analogous air transport operations. Only when the inter-island air transport operator(s) achieve world best in class levels of operating cost can their future be assured. Assuming that fuel and aircraft finance costs are at normal market levels the main cost area to be investigated are labour costs (including operating practices) for both Binter Canarias and bought in services.

Other marginal improvements may be achieved by:

- **Fleet Planning and Fleet Mix**

  Inter-island air services are currently provided by a modern fleet of some eleven turboprop aircraft of two types (6xATR72 and 5xCASA CN-235). The smaller aircraft (CASAs) provide seating for 45 passengers while the larger ATR72s carry 66-70 passengers. Operational restrictions constrain the use of one or more of these types at some of the airports used by Binter Canarias. A wet leased DC9 operated by Aviaco is used for some services.

  The choice of aircraft type, their number and the number of types used within the fleet are complex issues and beyond the scope of this assignment. SRI would, however, question whether the present fleet is optimum for the route structure. In particular there is no aircraft smaller than the 45 seat CASA to operate the "thin" routes in off-peak periods. Detailed analysis would be necessary to determine whether the introduction of an additional type is either necessary or would be cost-effective but it is possibly that it would enable the "social service" routes to be maintained at minimum cost. SRI also notes that the two types at present operated are largely incompatible. The use of aircraft from the same range [eg ATR42 (of similar capacity to the CASA CN-235) and ATR72] could provide economies in flight crews (provided common type ratings were used), maintenance costs and spares inventories.

- **Distribution and Handling Costs for Product Generated and Consumed within the Canary Islands**

  As mentioned above, 90% of inter-island passengers are Canary Islands residents. Nevertheless most reservations and ticket production are carried out through the Amadeus computer reservation system via the Iberia network. A flat charge of 300 Ptas (payable by Binter Canarias) is made per reservation, per passenger, whether used or not. This element of distribution cost translates to approximately 3 US cents per APK. In addition some 9-10% of ticket value is paid as direct commission to travel agents processing the reservation. This cost accounts for another 2 US cents per APK.

Whilst it is unrealistic to aim at eliminating these distribution costs it may be possible to reduce them substantially through initiatives such as:

Establishing a National Marketing Company (NMC) for the Canary Islands possibly with multiple computer reservation system links. The NMC would be a marketing/distribution tool for the Canary Islands' travel producers. This might permit differential pricing policies to be adopted for inter-island reservations as compared to peninsular Spanish and/or international reservations. It could also allow better access by the island travel and tourism producers to a wider range of travel trade outlets in originating markets.

Automated Ticketing Machines (ATMs) located at the airports and key island locations. Iberia have already tried and tested equipment and systems to achieve this. This type of equipment would be directly connected into the Binter Canarias seat inventory control, and could possibly reduce both the travel agent commissions and the Amadeus reservation system costs. If it were to be allied to the take up of the inter-island residents subsidy and be available at selected off airport sites it might account for a significant portion of issued tickets.

Another cost service area that should be examined is:

Check-in and other handling arrangements at the airports. Currently several of the arrangements are not sufficiently focussed on the needs of inter-island services (passenger and baggage flow through terminals, staffing levels, staff focus, etc.) In addition to improving product quality and delivery there may be scope for some small cost reductions.

5. AIRPORT CAPACITY ASSESSMENT

5.1 Responsibilities and Planning Procedures

In common with most Spanish airports, all seven Canary Islands commercial airports are owned by the central government through the Ministry for Public Works and Transport (MPWT). Various airport functions fall under different organisations within MPWT. The Spanish Airport Authority (OAAN) manages airport operations and maintenance under the Deputy Ministry for PWT. ATC, Air Navigation, Traffic Rights, and Airport Development are separate branches under the Director General of Civil Aviation (DGGA). In the latter-half of 1991 a new central organization called Aeropuertos Espanoles Navegacion Area (AENA) was set up to bring together OANN, ATC, and Air Navigation under a single entity. Airport master plan development, planning, and budgetary decisions are the responsibility of AENA with approvals from the DGCA and MPWT. Airport improvement budgets are allocated by MPWT annually. Landing fees and user charges are also set by MPWT. All airport revenues go to the central government.

On policy matters affecting the Canary Islands' airports the Autonomous Government liaises with the airport general managers and the above authorities. In Spain airport development involves the submission of Land Organisation Plans which are drafted and approved by the regional Governments through their Land Policy Offices are responsible for land planning. These plans are submitted for public information following previous contacts with the Ministry for Public Works and Transport so that the Ministry may issue its' opinion on airport expansion plans or construction of new airports and the consequent land reservation. The Municipal Authorities are involved when it comes to granting the building permission contemplated in the Land Organisation Plans of the Regional Government.

Airport development proposals are included within the relevant regional plan which run over a period of ten years. It is not essential that airport proposals are detailed in the regional plan as the airport master plan has a formal status. There are no noise restrictions on developments adjacent to an airfield within the regional plan. Only the airfield safeguarding requirements are included. As yet no specific arrangements are in hand to implement development zoning around Spanish airports. In 1991, however, the Ministry for Public Works and Transport created a State Department for Environmental Policy which will encourage development of plans of this nature.

Regulations regarding such matters as; operating hours, permissible aircraft types, numbers of movements, noise abatement procedures, noise monitoring, and differential charges are set on an airport by airport basis.

Airport capacity (runway, terminal, and apron) for all government airports is declared by a committee of four including (1) three section representatives within AENA (OAAN, ATC, and Traffic Rights), and (2) Iberia airlines. The greatest influence in determining capacity is typically exercised by AENA Traffic Rights and Iberia.

The duration of the planning and approval process can be lengthy (The new Gomera airport took many years before commencement of work). The minimum timespans are set by the Royal Decree on Environmental Impact Assessment which establishes a period of thirty business days for submission of a study on environmental impact to the public information procedure. The regional plans are not subject to examination in public, although the process can take up to two years from the production of a draft to final government approval. It is generally accepted that a medium term terminal expansion scheme would at best take in the region of six months for approval, with a major new terminal development taking at least one year.

5.2 Method of Approach

In this study SRI reviewed the principal airport capacity domains for the seven Canary Islands airports. The capacity domains considered were runway, terminal, surface access and air traffic control. A questionnaire was used to collect the necessary information from each airport. and interviews were carried out with senior staff at each airport. SRI was hoping to review the individual master plans but unfortunately AENA management declined to make these available, despite the best efforts of Consejeiro staff, and several contacts with AENA. The SRI team has therefore had to make capacity vs demand assessments without this input. Some airports had detailed capacity information available, most claimed that the detail solely resided in Madrid.

Using the results of the field interviews, SRI identified constraints on an airport by airport basis. This task involved a review of existing operations, political and/or environmental restrictions and identification of physical limitations at an airport.

The study did not include the creation of a formal demand forecast for each airport. SRI considered the various capacity elements against three demand scenarios to establish the possible timings for the resultant constraints.

The demand scenarios applied to all the airports were:

Low Case - A passenger movements compound growth rate of 2% per annum across all traffics. The passengers per aircraft movement were assumed to remain at current averages at each

airport[11] This growth rate probably best describes a static tourist market with growth coming largely from Canary Island residents.

Base Case - A passenger movements compound growth rate of 5% per annum across all traffics. The passengers per aircraft movement were assumed to remain at current averages at each airport. This growth rate fits well with historic Canary Islands and European trends and also fits conventional wisdom as to the most likely long term European air traffic growth.

High Case - A passenger movements compound growth rate of 7.5% per annum across all traffics. The passengers per aircraft movement were assumed to remain at current averages at each airport. This growth rate probably best describes a healthy tourist market giving good rates of Canary Islands GDP growth (and consequent increases in residents' demand for air travel). It also indicates a gradual impact of air liberalisation in Europe and assumes that Mediterranean tourist destinations are not afflicted with political turmoil. (Arguably the Canary Islands growth rates posted in 1991 and early 1992 may indicate the effects of the Balkan and Gulf wars).

The three demand scenarios for passenger and aircraft movement volumes were compared to the capacity of the runways; runway taxiways and exits; apron; terminal; and surface access. As appropriate this information was summarised in separate graphs. From analysis of the airport data and graphs SRI determined, for each demand scenario, the year in which capacity would become limited at each airport for each capacity element.

Capacity elements considered for each airport were:

Runway Capacity

SRI assessed runway capacity (including associated taxiways and exits) through a mix of theoretical and empirical approaches. The declared hourly runway capacity given to us by the airport and/or ATC was taken as reflecting a mix of the current operating procedures and the available technology at the airport. This declared capacity was assessed against likely maximum possible throughputs through two means:

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[11] Passengers per aircraft is the means of converting total passenger forecasts into aircraft movement forecasts at each airport. As many of the airport constraint elements are primarily affected by aircraft movement the trends in this ratio can be vital in predicting when and if an airport will be constrained. SRI considers that for the Canary Island airports the conflicting trends affecting the ratio are likely to cancel each other out maintaining current individual averages over the next eighteen years. In brief liberalization tends to reduce the ratio by driving up service frequency and number of source/destination points whilst larger aircraft tend to increase the ratio. Also it is likely that the ratio will be reduced as the inter-island services increase their proportion of the total Canary Islands air traffic movements mix.

1. An empirical comparison against current best case operating performances for similar situations throughout Western Europe.
2. A review of pure runway capacity using a practical ratio of peak hour to annual operations developed by SRI for IATA.

These approaches indicated that it is necessary to consider two aspects of potential constraints to the Canary Islands airports runway capacity. First the pbysical capacity of the actual runway in which case only the airports of Tenerife and Gran Canaria could have movement constraints at peak periods around the year 2000. Second the declared runway capacity deriving from the available approach control technology, and the present runway taxiways/exits.type and configuration. Current declared runway capacities and known planned improvements imply that all of the Archipelago's airports could suffer peak period constraints under one or more of the demand scenarios.

Apron

SRI reviewed apron capacity through an analysis of peak hourly movements and has assumed that average turn around times of one hour would probably be the best that could realistically be achieved at such periods.

Terminal physical limits

SRI considered peak hourly flows as provided by airport management and has assumed that the maximum peak hourly flow during the course of a year had a relationship of somewhere between 0.05 and 0.075% of the annual physical capacity of the airport terminal. SRI used these assumptions to construct a terminal physical capacity range for each airport.

Terminal operations

The study's scope did not permit detailed surveys of peak period passenger queuing and waiting time at the various airports. Nevertheless the results of SRI's interviews with the tour operators and charter airlines made it clear that this was a substantial issue at the main tourist airports of Gran Canaria, Lanzarote and Tenerife Sur,. In SRI's judgement this capacity issue has less to do with terminal physical size but rather is a function of the internal arrangements for handling peak passenger flows and the rules and procedures operated by the check-in and ground handling agents.

Surface Access

The responses to SRI's surveys and reviews of the current and proposed road access plans, taken together with estimates of the road traffic generated by the airports, indicate no substantial constraint in this capacity domain other than those generated by general road traffic growth on the main road arteries. SRI also reviewed current and planned vehicle parking provision and compared this to the air traffic scenarios. In general airport vehicle parking, whilst not generous, is adequate for the IT flows. There are three important caveats;

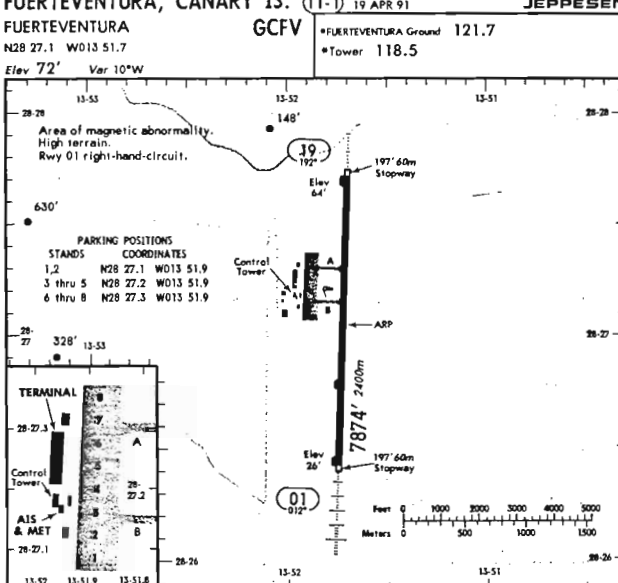
- short term parking for inter-island resident air travellers is inadequate, particularly at the two inter-island hubs of Gran Canaria and Tenerife Norte
- timeshare and other holiday home users are likely to demand greater airport car parking provision (car rental and private)
- coach parking arrangements at Gran Canaria are currently inadequate (this is planned to be rectified with the completion of the second terminal).

Landside Traffic Flow management

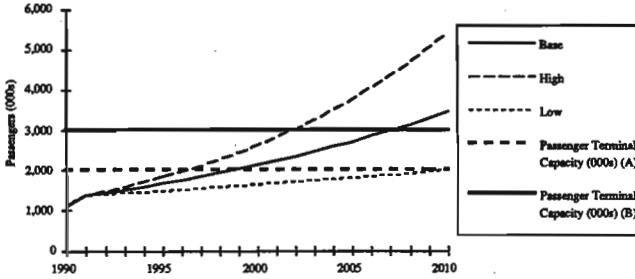
SRI interviews with the tour operators and charter airlines indicate that there exists poor coordination between these stakeholders and the main tourist airports. In consequence passengers are facing additional transit and handling times to/from and at the airports and ultimately additional costs passed on by the tour operators.

AIRPORT:	Fuerteventura	CODE:	GCFV

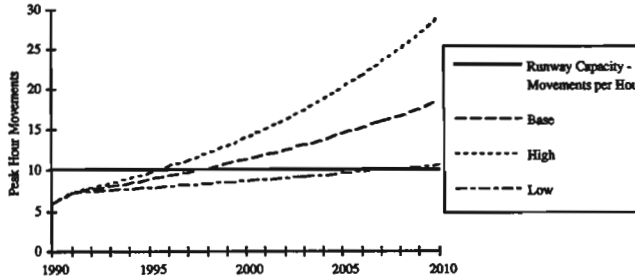
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Fuerteventura - Terminal Capacity



Fuerteventura - Runway Capacity



FUERTEVENTURA

AIRPORT CODE	:	GCFV
1990 COMMERCIAL PASSENGERS (000s)	:	
National	:	405
International	:	706
1990 AIRCRAFT MOVEMENTS	:	1,092

Airport Capacity

- Single runway (2,400 m) without parallel taxiways. Commercial take off and landings require taxiing on runway.
- Declared runway capacity is 10 movements per hour.
- Eight apron stands available (all remote)
- Single terminal serves international and domestic traffic.
- Theoretical annual terminal capacity stated as 2 million passengers.
- Airport operations 0800-2300
- Limited passenger facilities
- Twelve check-in desks 7 for international and 5 for domestic traffic
- Transit times for international flights 45-60 minutes
- Transit times for domestic flights 35 minutes
- Land available for airport expansion
- Airport anticipates 5% p.a. growth through 1998

Expansion Plans*

- Airport navigational aids (stated by airport management) to be upgraded.
- Two additional check-in desks planned for 1992/93.

Comments

- All ground handling (passengers and aircraft) carried out by Iberia.

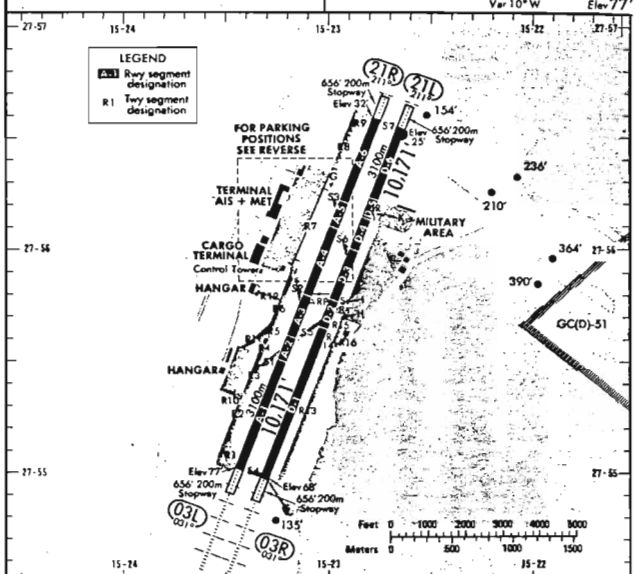
Constraints

- Greater attention required to passenger facilities
- Most immediate operational constraint is likely to be number of aircraft stands
- Achievement of more movements per hour would require additional taxiways/exits etc as well as increase in terminal capacity.

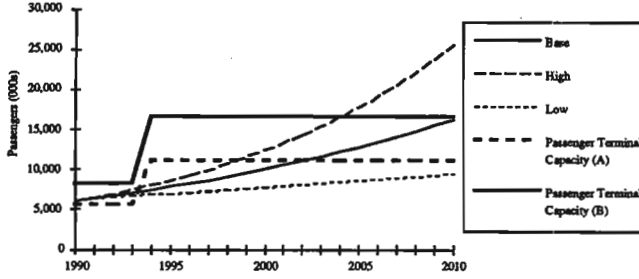
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	Gran Canaria	CODE:	GCLP

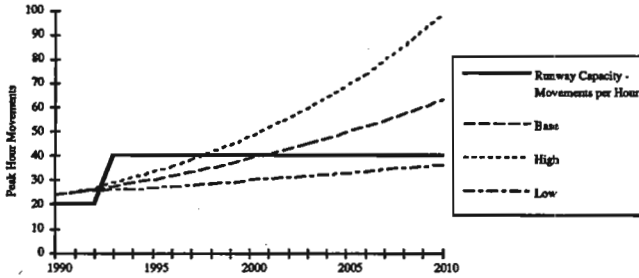
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Gran Canaria -Terminal Capacity



Gran Canaria - Runway Capacity



GRAN CANARIA

AIRPORT CODE	: GCLP
1990 COMMERCIAL PASSENGERS (000S)	:
National	: 39,773
International	: 26,728
1990 AIRCRAFT MOVEMENTS	: 66,501

Airport Capacity

- Parallel dependent runways (3100 m) with parallel taxiway
- Declared runway capacity is 30 movements per hour
- Apron stands for 53 apron stands (7 with loading bridges, 46 remote)
- Single terminal serves all traffic
- Terminal capacity is 3000 passengers per hour (arrivals and departures)
- 29 check-in desk (15 for inter-island/peninsular, 14 for international passengers)
- 1000 car parking spaces
- Dedicated freight terminal

Expansion Plans*

- New terminal under construction due for completion by end of 1992. The new terminal will double passenger capacity, add 150 coach and 1000 car parking spaces and allow for an additional 10 apron stands with loading bridges

Comments

- All ground handling (passengers and aircraft) carried out by Iberia
- Gran Canaria is one of the inter-island hubs and consequently should have very good private car parking facilities. It does not, and the plan for enlargement will not rectify this situation.

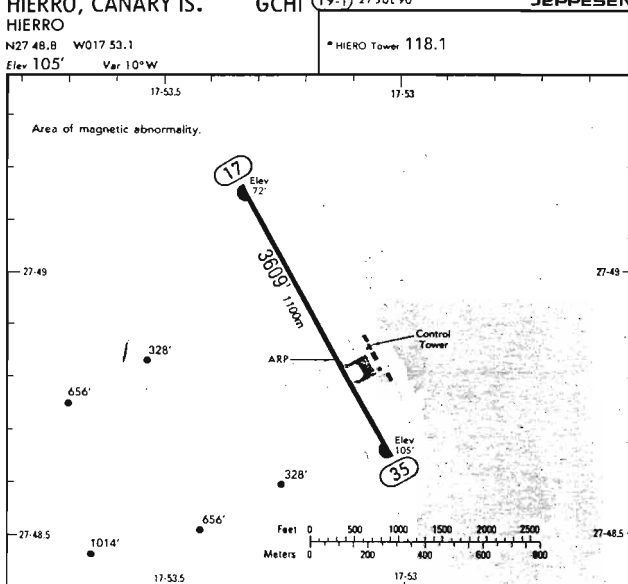
Constraints

- Total number of stands would seem sufficient under all scenarios. The use of the stands and in particular charging for the use of the loading bridges causes operating restrictions.
- Charter traffic arrives at mid-day and departs early afternoon. Although physical size of terminal does not appear to be a problem the current arrangements for check-in and flow through the terminal must be redesigned to improve customer service greatly and eliminate an unacceptably high rate of queuing delay.
- Current lack of coach parking facilities can cause double parking and congestion in front of the terminal; this should be eliminated with the construction of the new terminal and the provision of 150 dedicated coach parking spaces .

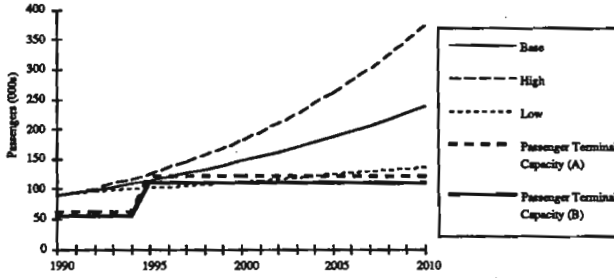
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	Hierro	CODE:	GCHI

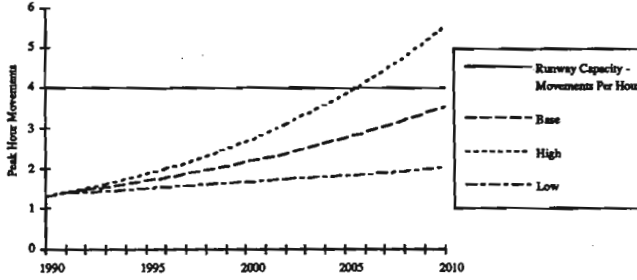
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Hierro - Terminal Capacity



Hierro - Runway Capacity



HIERRO

AIRPORT CODE	:	GCHI
1990 COMMERCIAL PASSENGERS (000S)	:	
National	:	89
1990 AIRCRAFT MOVEMENTS	:	2,653

Airport Capacity

- Single runway (1100 m) without a taxiway. Commercial take-offs and landing require taxi-ing on runway
- Declared runway capacity is 5 (Summer) 3 movements (Winter) per hour
- Apron stands for 2/3 commercial aircraft depending on type
- Single terminal serves scheduled inter-island flights
- Terminal capacity is 272 passengers per hour
- 1 check-in desk

Expansion Plans*

- Currently runway is being extended by 150m completed by June 1992
- New terminal will be built on the south side for the airport in 1993, this will increase annual passenger capacity to 120,000.

Comments

- All ground handling (passengers and aircraft) carried out by Iberia.
- At present the airport is only used for inter-island flights to Gran Canaria and Tenerife.

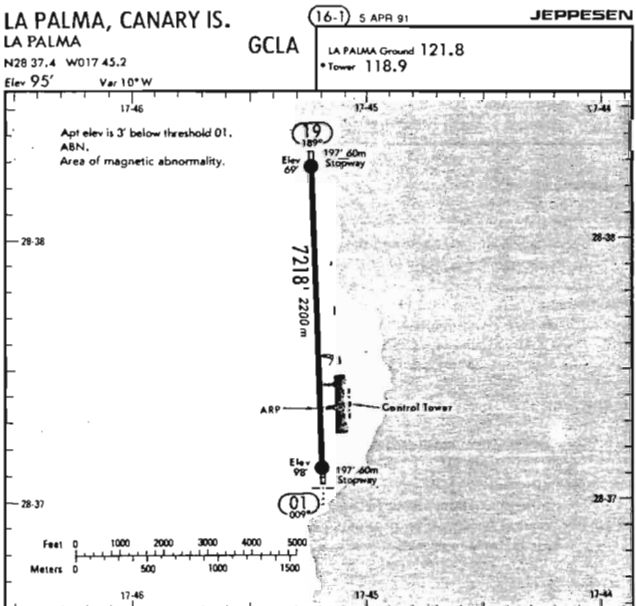
Constraints

- Runway length imposes limitation on aircraft type (ATRs) and load carried (34 maximum when weather is bad). Extension of the runway should enable ATRs to take off at full capacity.
- Runway operations restricted by prevailing winds from the North.
- Terminal is inadequate in terms of physical capacity in delay situations (ie bad weather). This will remain so even after enlargement.

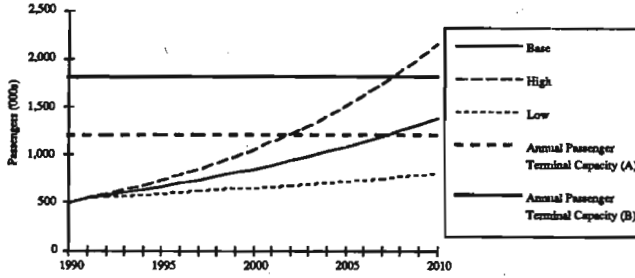
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	La Palma	CODE:	GCLA

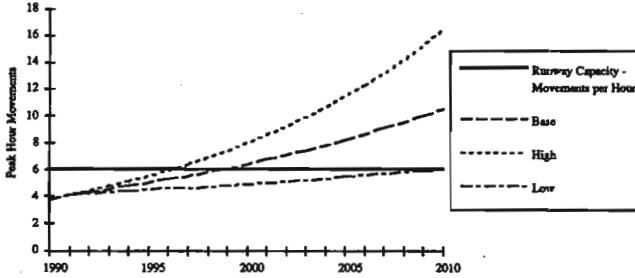
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



La Palma - Terminal Capacity



La Palma - Runway Capacity



LA PALMA

AIRPORT CODE	:	GCLA
1990 COMMERCIAL PASSENGERS (000s)	:	
National	:	416
International	:	76
1990 AIRCRAFT MOVEMENTS	:	7,528

Airport Capacity

- Single runway (2,200m) with a parallel taxiway
- Declared runway capacity is 6 movements per hour
- 6 apron stands in terminal area
- Single terminal serves all traffic
- Terminal capacity is 900 passengers per hour
- 2 baggage carousels
- 900 car, 7 coach and 20-25 taxi parking spaces

Expansion Plans*

- A new terminal is planned to possibly come into operation within two years. It would handle an additional 900 international passengers per hour

Comments

- All ground handling (passengers and aircraft) carried out by Iberia

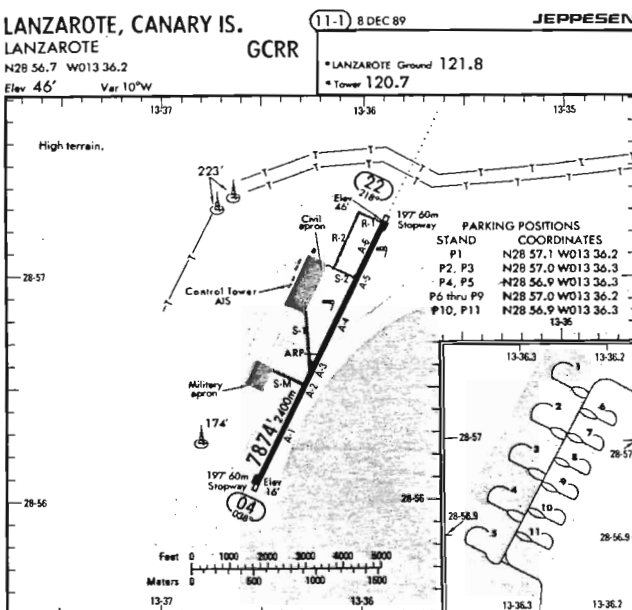
Constraints

- Although terminal facilities are not a problem at present this could change if the mix of traffic between inter-island and international changes as expected by airport management (an estimated 40% increase in 1992).
- Aircraft parking is a constraint
- Terminal is inadequate in terms of physical capacity when delays occur during bad weather which can last up to 5 hours.

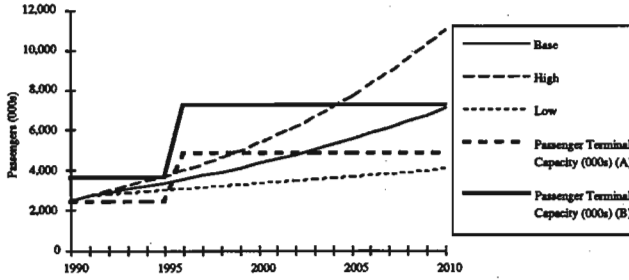
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	Lanzarote	CODE:	GCRR

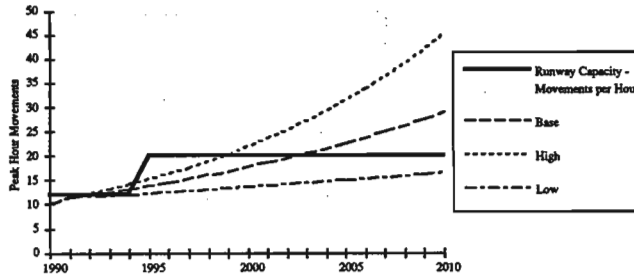
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Lanzarote - Terminal Capacity



Lanzarote - Runway Capacity



LANZAROTE

AIRPORT CODE	:	GCRR
1990 COMMERCIAL PASSENGERS (MILLIONS)	:	
National	:	928
International	:	1,497
1990 AIRCRAFT MOVEMENTS	:	20,328

Airport Capacity

- Single runway (2400m) without parallel taxiway. Commercial take-offs on runway 04 and landings on runway 22 require taxiing on runway.
- Declared runway capacity is 12 movements per hour
- 11 apron stands all (2 terminal 9 remote)
- Single terminal serves international and domestic traffic
- Terminal capacity is 1,800 passengers per hour
- 16 check-in desks (8 international/charter 8 domestic)
- 3 baggage carousels
- At present (May 1992) only 2 buses available for airside passenger handling (3 additional buses due July 1992)
- 40 coach and 30 taxi parking spaces

Expansion Plans*

- According to airport management an additional terminal is due to be completed by 1995.
- New terminal will provide 16 additional check-in desks .
- According to airport management an additional 10 aircraft stands (5 with loading bridges) due to be completed by 1995. There will be a fee for the loading bridges.

Comments

- All ground handling (passengers and aircraft) carried out by Iberia

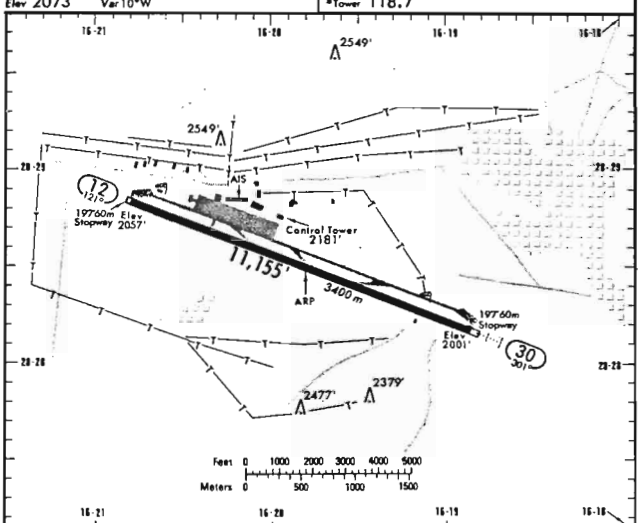
Constraints

- Buses are a current constraint.
- Apron capacity at Lanzarote is presently constrained and will remain so until new apron facilities are provided.
- Most ATC delays/problems are attributable to the constraints caused by Europe, Casablanca and Madrid.
- Although physical size of terminal does not appear to be a problem the current arrangements for check-in and flow through the terminal must be redesigned to improve customer service greatly and eliminate an unacceptably high rate of queuing delay.

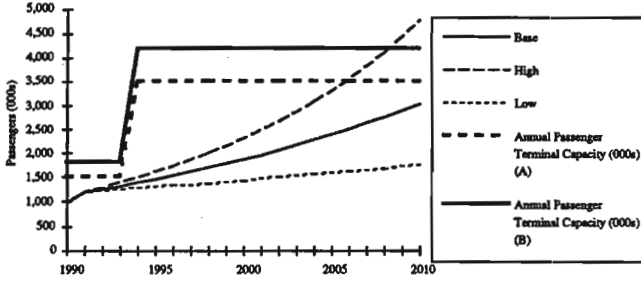
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	Tenerife Norte	CODE:	GCXO

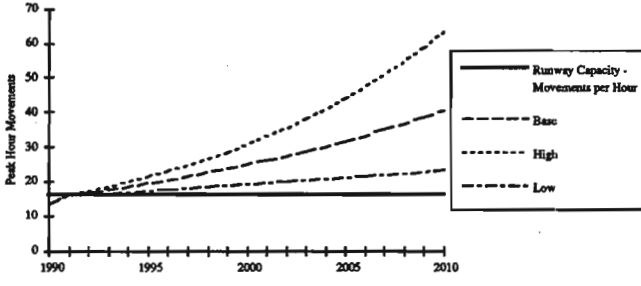
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Tenerife Norte - Terminal Capacity



Tenerife Norte - Runway Capacity



TENERIFE NORTE

AIRPORT CODE	:	GCXO
1990 COMMERCIAL PASSENGERS (000S)	:	
National	:	998
1990 AIRCRAFT MOVEMENTS	:	26,522

Airport Capacity

- Normally handles inter-island, domestic and general aviation traffic only
- Single runway (3400m) with parallel taxiway.
- Declared runway capacity is 16 movements per hour
- 12-15 apron stands depending on aircraft type, all remote
- Single terminal serves international and domestic traffic
- Declared annual terminal capacity is 1.5 million passengers per annum.
- 7 check-in desks
- Binter base 4-5 aircraft at airport (depending on season)
- Dedicated freight terminal

Expansion Plans*

- According to airport management an additional terminal is due to be completed by 1993.
- New terminal will provide capacity for an additional 2 million passengers per annum
- New terminal will provide 17 additional check-in desks.
- According to airport management an additional 10 aircraft stands (5 with loading bridges) due to be completed by 1995.

Comments

- All ground handling (passengers and aircraft) carried out by Iberia

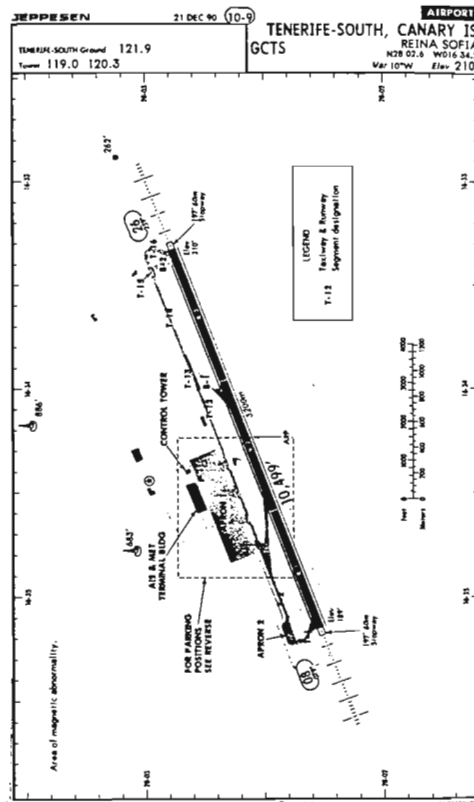
Constraints

- Prevailing weather conditions conducive to continuous airport operations; this can lead to significant delays in inter-island traffic
- The airport, in all probability, will remain an inter-island hub for the foreseeable future because of its proximity to Santa Cruz
- Taxiways and exits seem to be constraining the runway capacity
- If the new terminal is not built, then terminal capacity will be constrained by 1996 under all scenarios

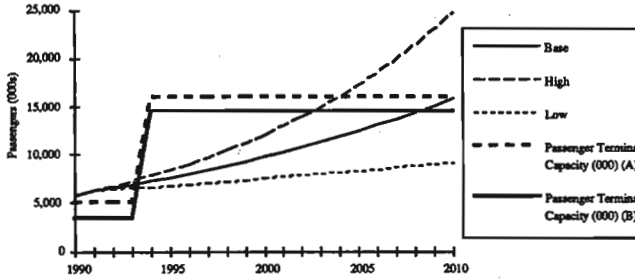
* *AENA REFUSED TO CONFIRM ANY EXPANSION PLANS GIVEN TO SRI BY AIRPORT MANAGEMENT*

AIRPORT:	Tenerife Sur	CODE:	GCTS

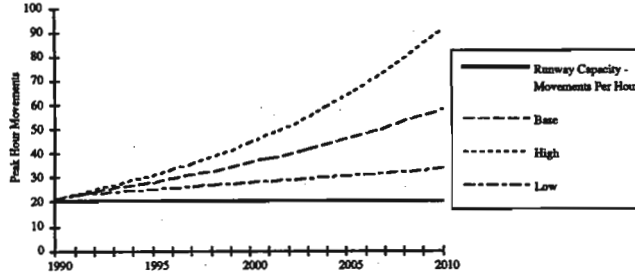
AIRPORT RUNWAY AND TERMINAL LAYOUT (Reproduced with permission of Jeppesen Sanderson, Inc.)



Tenerife Sur - Terminal Capacity



Tenerife Sur - Runway Capacity



TENERIFE SUR

AIRPORT CODE	:	GCTS
1990 COMMERCIAL PASSENGERS (000S)	:	
National	:	1,914
International	:	3,815
1990 AIRCRAFT MOVEMENTS	:	3,955

Airport Capacity

- Handles international, peninsular Spanish and limited inter-island traffic only
- Single runway (3200m) with parallel taxiway.
- Declared runway capacity is 20 movements per hour
- Airport operational 24 hours a day
- 24 apron stands (15 in terminal area). The seven large stands can be used to accommodate a larger number of smaller aircraft
- Single terminal serves all traffic
- Theoretical annual terminal capacity is 5 million passengers per annum.
- 23 check-in desks
- International carriers may have aircraft over-nighting especially during Winter season

Expansion Plans*

- Construction is currently underway for a new cargo terminal (completion during 1993)
- 15 additional check-in desks to be completed by October 1992
- Hi-speed runway exit to be completed during 1992.
- Apron area being increased by 77,000 sq.m by end of 1992, which will give an additional 8 aircraft stands.
- ILS CAT I being installed on runway 08
- According to airport management an additional terminal is due to be completed by 1995.

Comments

- All ground handling (passengers and aircraft) carried out by Iberia

Constraints

- Assuming hi-speed exists are completed by the end of 1992 and operational handling improves, then taxiways should cease to be a constraint. Taxiway constraints will be identical to runway constraints.
- If new terminal is built by 1995, terminal capacity becomes unconstrained and is not constrained again until the year 2005 on the high forecast.
- If the additional eight apron stands become operational by 1995 apron capacity becomes unconstrained and is not constrained again until 1998 on the high forecast and 2000 on the base forecast.
- With the growth of time share there is a definite shift in the type of tourist arrivals. This may require additional car parking and rental car spaces.

APPENDIX A

Database for the Seven Commercial Airports Within the Archipelago

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled (Arrivals)	201	194	204	214	225	236	248	261	274	287	302	385	491
International													
National	201	194	204	214	225	236	248	261	274	287	302	385	491
Scheduled (Departures)	204	197	206	217	228	239	251	264	277	291	305	389	497
International													
National	204	197	206	217	228	239	251	264	277	291	305	389	497
Non-Scheduled (Arrivals)	354	494	518	544	571	600	630	661	695	729	766	977	1,247
International	354	494	518	544	571	600	630	661	695	729	766	977	1,247
National													
Non-Scheduled (Departures)	353	489	514	540	567	595	625	656	689	723	759	969	1,237
International	353	489	514	540	567	595	625	656	689	723	759	969	1,237
National													
Transit													
Transfer													
TOTAL PASSENGERS	1,112	1,374	1,443	1,515	1,591	1,670	1,754	1,842	1,934	2,030	2,132	2,721	3,472
AIRCRAFT MOVEMENTS													
Scheduled (Arrivals)	3,202	3,837	4,029	4,230	4,442	4,664	4,897	5,142	5,399	5,669	5,952	7,597	9,696
International													
National	3,202	3,837	4,029	4,230	4,442	4,664	4,897	5,142	5,399	5,669	5,952	7,597	9,696
Scheduled (Departures)	3,203	3,838	4,030	4,232	4,443	4,665	4,899	5,143	5,401	5,671	5,954	7,599	9,699
International													
National	3,203	3,838	4,030	4,232	4,443	4,665	4,899	5,143	5,401	5,671	5,954	7,599	9,699
Non-Scheduled (Arrivals)	2,728	3,269	3,432	3,604	3,784	3,973	4,172	4,381	4,600	4,830	5,071	6,472	8,260
International	2,728	3,269	3,432	3,604	3,784	3,973	4,172	4,381	4,600	4,830	5,071	6,472	8,260
National													
Non-Scheduled (Departures)	2,722	3,262	3,425	3,596	3,776	3,965	4,163	4,371	4,590	4,819	5,060	6,458	8,242
International	2,722	3,262	3,425	3,596	3,776	3,965	4,163	4,371	4,590	4,819	5,060	6,458	8,242
National													
General Aviation													
Military													
Cargo													
Mail													
Other													
TOTAL AIRCRAFT MOVEMENTS	11,855	14,206	14,916	15,662	16,445	17,267	18,131	19,037	19,989	20,989	22,038	28,127	35,897
Peak Aircraft Movements (Month)	Dec	Dec											
Peak Aircraft Movements (Arrivals)													
Peak Aircraft Movements (Departures)													
TOTAL AIRCRAFT PEAK MOVEMENTS	1092	1355											

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Charter Arriving	18	25	26	28	29	31	32	34	35	37	39	49	61
Charter Departing	481	487	511	537	564	592	621	653	685	719	755	944	1,180
Scheduled Arriving	1,858	1,844	1,937	2,033	2,135	2,242	2,354	2,472	2,595	2,725	2,861	3,576	4,471
Scheduled Departing	364	301	316	332	348	366	384	403	423	444	467	583	729
Mail (000 Kgs)													
TOTAL CARGO	2,721	2,657	2,790	2,930	3,076	3,230	3,391	3,561	3,739	3,926	4,122	5,153	6,441
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	10	10	10	10	10	10	10	10	10	10	10	10	10
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075	13,075
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	8	8	8	8	8	8	8	8	8	8	8	8	8
Large (DC-10)	3	3	3	3	3	3	3	3	3	3	3	3	3
Medium (B-707)													
Small MD-83, 737))	5	5	5	5	5	5	5	5	5	5	5	5	5
Remote positions													
TOTAL PARKING POSITIONS	8	8	8	8	8	8	8	8	8	8	8	8	8
TERMINAL CAPACITY													
Annual passenger capacity (000)													
Arrivals per hour	750	750	750	750	750	750	750	750	750	750	750	750	750
International													
National													
Departures per hour	750	750	750	750	750	750	750	750	750	750	750	750	750
International													
National													
Peak month terminal utilisation													
Month	August	August											
Passenger throughput	135,448	141,792											

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled (Arrivals)	1,249	1,244	1,306	1,371	1,440	1,512	1,587	1,667	1,750	1,838	1,930	2,463	3,145
International	97	95	100	105	110	115	121	127	134	140	147	188	240
National	1,143	1,149	1,206	1,267	1,330	1,397	1,466	1,540	1,617	1,697	1,782	2,275	2,905
Scheduled (Departures)	1,245	1,246	1,308	1,374	1,442	1,514	1,590	1,670	1,753	1,841	1,933	2,467	3,148
International	92	96	101	106	112	117	123	129	136	142	150	191	244
National	1,173	1,149	1,207	1,267	1,331	1,397	1,467	1,540	1,617	1,698	1,783	2,276	2,905
Non-Scheduled (Arrivals)	1,830	1,984	2,083	2,187	2,297	2,412	2,532	2,659	2,792	2,931	3,078	3,928	5,014
International	1,645	1,800	1,890	1,985	2,084	2,188	2,298	2,413	2,533	2,660	2,793	3,565	4,549
National	187	184	193	203	213	223	234	246	258	271	285	364	464
Non-Scheduled (Departures)	1,810	1,963	2,061	2,164	2,272	2,386	2,505	2,630	2,762	2,900	3,045	3,886	4,960
International	1,668	1,786	1,875	1,969	2,068	2,171	2,280	2,394	2,513	2,639	2,771	3,536	4,514
National	207	177	185	195	204	215	225	237	248	261	274	350	446
Other (National)	0	124	131	137	144	151	159	167	175	184	193	246	314
Other (International)	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL PASSENGERS	6,143	6,436	6,758	7,096	7,451	7,823	8,215	8,625	9,057	9,509	9,985	12,744	16,265
Transit	395	266	280	294	308	324	340	357	373	393	413	527	672
National	146	172	181	190	199	209	220	231	242	254	267	341	435
International	139	94	99	104	109	115	120	126	133	139	146	187	238
AIRCRAFT MOVEMENTS													
Scheduled (Arrivals)	16,286	17,935	18,832	19,773	20,762	21,800	22,890	24,035	25,236	26,498	27,823	35,577	44,964
International	2,067	2,003	2,103	2,208	2,319	2,435	2,556	2,684	2,818	2,959	3,107	3,951	5,024
National	14,219	15,932	16,729	17,565	18,443	19,365	20,334	21,350	22,418	23,539	24,716	31,626	39,960
Scheduled (Departures)	16,289	17,946	18,843	19,785	20,775	21,813	22,904	24,049	25,252	26,514	27,840	35,599	45,011
International	2,075	2,008	2,108	2,214	2,325	2,441	2,563	2,691	2,825	2,967	3,115	3,961	5,036
National	14,215	15,938	16,735	17,572	18,450	19,373	20,341	21,358	22,426	23,548	24,725	31,638	39,975
Non-Scheduled (Arrivals)	15,348	17,177	18,036	18,938	19,885	20,879	21,923	23,019	24,170	25,378	26,647	33,882	43,063
International	11,127	12,152	12,760	13,398	14,067	14,771	15,509	16,285	17,099	17,954	18,852	23,970	30,479
National	4,221	5,025	5,276	5,540	5,817	6,108	6,413	6,734	7,071	7,424	7,795	9,912	12,604
Non-Scheduled (Departures)	15,351	17,323	18,189	19,099	20,054	21,056	22,109	23,214	24,375	25,594	26,874	34,178	43,449
International	11,122	12,294	12,909	13,554	14,232	14,943	15,691	16,475	17,299	18,164	19,072	24,250	30,835
National	4,229	5,029	5,280	5,544	5,822	6,113	6,418	6,739	7,076	7,430	7,802	9,928	12,614
Other National	2,891	2,621	2,752	2,890	3,034	3,186	3,345	3,513	3,688	3,873	4,066	5,170	6,574
Arrivals	1,468	1,341	1,408	1,479	1,552	1,630	1,712	1,797	1,887	1,981	2,080	2,645	3,364
Departure	1,423	1,280	1,344	1,411	1,482	1,556	1,634	1,715	1,801	1,891	1,986	2,525	3,211
Other International	537	468	491	516	542	569	597	627	659	691	726	923	1,174
Arrivals	355	294	346	258	271	284	299	314	329	346	363	462	587
Departure	182	294	246	258	271	284	299	314	329	346	363	462	587
TOTAL AIRCRAFT MOVEMENTS	65,501	73,475	77,144	81,691	85,851	90,303	95,169	98,487	105,208	108,549	113,976	144,923	184,275
Peak Aircraft Movements (Month)													
Peak Aircraft Movements (Arrivals)													
Peak Aircraft Movements (Departures)													
TOTAL AIRCRAFT PEAK MOVEMENTS													

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
National	25,882	24,393	25,613	26,893	28,238	29,650	31,133	32,689	34,324	36,040	37,842	47,302	59,128
Arrivals	13,759	13,761	14,530	17,377	18,246	19,158	20,116	21,122	22,178	23,287	24,451	30,564	38,205
Departures	10,123	8,632	9,083	9,516	9,992	10,492	11,016	11,567	12,146	12,753	13,391	16,738	20,923
International	8,824	7,952	8,350	8,767	9,206	9,666	10,149	10,657	11,190	11,749	12,337	15,421	19,276
Arrivals	2,371	2,241	2,353	2,471	2,594	2,724	2,860	3,003	3,153	3,311	3,477	4,346	5,432
Departures	6,453	5,711	5,997	6,297	6,611	6,942	7,289	7,653	8,036	8,438	8,860	11,075	13,843
Mail (000 Kgs)	7,762	7,875	8,269	8,683	9,117	9,573	10,051	10,554	11,081	11,635	12,217	15,272	19,089
National	7,579	7,689	8,073	8,477	8,901	9,346	9,813	10,304	10,819	11,360	11,928	14,910	18,638
International	183	186	196	205	216	226	238	250	262	275	289	361	452
TOTAL CARGO	40,468	40,221	42,232	44,343	46,560	48,889	51,333	53,900	56,595	59,424	62,395	77,994	97,495
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	20	20	20	40	40	40	40	40	40	40	40	40	40
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	82,635	82,635	82,633	165,240	165,240	165,240	165,240	165,240	165,240	165,240	165,240	#REF!	#REF!
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	7	7	7	17	17	17	17	17	17	17	17	17	17
Large													
Medium (B-707)													
Small													
Remote positions	46	46	46	46	46	46	46	46	46	46	46	46	46
TOTAL PARKING POSITIONS	53	53	53	63	63	63	63	63	63	63	63	63	63
TERMINAL CAPACITY													
Annual passenger capacity (000)													
Arrivals per hour	3,130	3,130	3,130	6,130	6,130	6,130	6,130	6,130	6,130	6,130	6,130	6,130	6,130
International													
National													
Departures per hour	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
International													
National													
Peak month terminal utilisation													
Month													
Passenger throughput (000)													

Airport: Hierro **Code:**

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled	87	91	95	100	105	111	116	122	128	134	141	181	230
International													
National	87	91	95	100	105	111	116	122	128	134	141	181	230
General Aviation	1	1	1	1	2	2	2	2	2	2	2	3	3
Air Taxi Charter	0	0	0	0	0	0	0	0	0	0	0	0	0
Military	1	2	2	2	2	2	3	3	3	3	3	4	5
TOTAL PASSENGERS	89	94	99	104	109	115	120	126	133	139	146	187	238
AIRCRAFT MOVEMENTS													
Scheduled	2,366	2,178	2,287	2,401	2,521	2,647	2,780	2,919	3,065	3,218	3,379	4,313	5,503
International													
National	2,366	2,178	2,287	2,401	2,521	2,647	2,780	2,919	3,065	3,218	3,379	4,313	5,503
General Aviation	273	376	395	415	435	457	480	504	529	556	583	745	950
Air Taxi & Private	14	12	13	13	14	15	15	16	17	18	19	24	30
Military	254	346	363	381	401	421	442	464	487	511	537	685	874
TOTAL AIRCRAFT MOVEMENTS	2,653	2,912	3,058	3,210	3,371	3,540	3,717	3,902	4,097	4,302	4,517	5,767	7,358
Peak Aircraft Movements (Month)	August	May											
Peak Aircraft Movements	230	202											
Peak Aircraft Movements PER HOUR	8												
TOTAL AIRCRAFT PEAK MOVEMENTS													

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Freight (000 Kgs)													
National Scheduled	295	307	322	338	355	373	392	411	432	454	476	595	744
Mail (000 Kgs)	42	44	46	49	51	53	56	59	62	65	68	85	107
TOTAL CARGO	337	351	322	338	355	373	392	411	432	454	476	595	744
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	4	4	4	4	4	4	4	4	4	4	4	4	4
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128	3,128
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	8	8	8	8	8	8	8	8	8	8	8	8	8
Large (DC-10)													
Medium (B-707)													
Small MD-83, 737))	8	8	8	8	8	8	8	8	8	8	8	8	8
Remote positions													
TOTAL PARKING POSITIONS	8	8	8	8	8	8	8	8	8	8	8	8	8
TERMINAL CAPACITY													
Annual passenger capacity (000)	60	60	60	60	60	120	120	120	120	120	120	120	120
Arrivals per hour	136	136	136	136	136	272	272	272	272	272	272	272	272
International													
National													
Departures per hour	136	136	136	136	136	272	272	272	272	272	272	272	272
International													
National													
Peak month terminal utilisation													
Month	August	August											
Passenger throughput	429	466											

Airport: La Palma

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled (Arrivals)	204	214	225	236	248	261	274	287	302	317	333	425	542
International													
National	204	214	225	236	248	261	274	287	302	317	333	425	542
Scheduled (Departures)	207	216	227	238	250	263	276	290	304	319	335	428	546
International													
National	207	216	227	238	250	263	276	290	304	319	335	428	546
Non-Scheduled (Arrivals)	39	53	55	58	61	64	67	71	74	78	82	104	133
International	36	49	52	54	57	60	63	66	69	73	76	97	124
National	3	3	4	4	4	4	4	5	5	5	5	7	9
Non-Scheduled (Departures)	38	51	53	56	59	62	65	68	72	75	79	101	129
International	35	48	50	53	56	58	61	64	68	71	74	95	121
National	3	3	3	3	3	4	4	4	4	4	4	6	7
Transit	5	10	10	11	11	12	12	13	14	14	15	19	25
Transfer													
TOTAL PASSENGERS	492	544	571	600	630	661	694	729	765	803	844	1,077	1,373
AIRCRAFT MOVEMENTS													
Scheduled (Arrivals)	3,035	3,554	3,732	3,918	4,114	4,320	4,536	4,763	5,001	5,251	5,513	7,030	8,966
International													
National	3,035	3,554	3,732	3,918	4,114	4,320	4,536	4,763	5,001	5,251	5,513	7,030	8,966
Scheduled (Departures)	3,031	3,553	3,731	3,917	4,113	4,319	4,535	4,761	4,999	5,249	5,512	7,028	8,963
International													
National	3,031	3,553	3,731	3,917	4,113	4,319	4,535	4,761	4,999	5,249	5,512	7,028	8,963
Non-Scheduled (Arrivals)	356	481	505	530	557	585	614	645	677	711	746	952	1,213
International	279	396	416	437	458	481	505	531	557	585	614	783	999
National	77	85	89	94	98	103	108	114	120	126	132	168	214
Non-Scheduled (Departures)	360	482	506	531	558	586	615	646	678	712	748	953	1,216
International	273	396	416	437	458	481	505	531	557	585	614	783	999
National	87	86	90	95	100	105	110	115	121	127	133	170	217
General Aviation	388	463	486	510	536	563	591	620	651	684	718	916	1,168
Military	358	374	393	412	433	455	477	501	526	553	580	740	943
Cargo													
Mail													
Other													
TOTAL AIRCRAFT MOVEMENTS	7,528	8,907	9,352	9,820	10,311	10,827	11,368	11,936	12,533	13,160	13,818	17,620	22,469
Peak Aircraft Movements (Month)													
Peak Aircraft Movements (Arrivals)													
Peak Aircraft Movements (Departures)													
TOTAL AIRCRAFT PEAK MOVEMENTS													

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Freight (000 Kgs)	2,252	2,022	2,123	2,229	2,341	2,458	2,581	2,710	2,845	2,987	3,137	3,930	4,921
Mail (000 Kgs)	446	437	458.85	482	506	531	558	586	615	646	678	856	1,080
TOTAL CARGO	2,698	2,459	2,123	2,229	2,341	2,458	2,581	2,710	2,845	2,987	3,137	3,930	4,921
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	6	6	6	6	6	6	6	6	6	6	6	6	6
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570	6,570
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	6	6	6	6	6	6	6	6	6	6	6	6	6
Large (DC-10)													
Medium (B-707)													
Small (MD-83, 737)	6	6	6	6	6	6	6	6	6	6	6	6	6
Remote positions													
TOTAL PARKING POSITIONS	6	6	6	6	6	6	6	6	6	6	6	6	6
TERMINAL CAPACITY													
Annual passenger capacity (000)													
Arrivals per hour	484	484	484	484	484	484	484	484	484	484	484	484	484
International													
National													
Departures per hour	416	416	416	416	416	416	416	416	416	416	416	416	416
International													
National													
Peak month terminal utilisation													
Month	August												
Passenger throughput	800												

Airport: Lanzarote

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled	790	722	759	797	836	878	922	968	1,017	1,067	1,121	1,592	1,826
International	69	12	13	13	14	15	15	16	17	18	19	25	30
National	721	710	746	783	822	864	907	952	1,000	1,050	1,102	1,477	1,796
Non-Scheduled	1,689	2,063	2,166	2,275	2,388	2,508	2,633	2,765	2,903	3,048	3,200	4,289	5,214
International	1,428	1,717	1,805	1,893	1,988	2,087	2,191	2,301	2,416	2,537	2,664	3,570	4,339
National	260	346	363	382	401	421	442	464	487	511	537	720	875
Transit													
Transfer													
TOTAL PASSENGERS	2,479	2,786	2,925	3,071	3,225	3,386	3,555	3,733	3,919	4,115	4,321	5,791	7,039
AIRCRAFT MOVEMENTS													
Scheduled	8,670	9,761	10,249	10,762	11,300	11,865	12,458	13,081	13,735	14,421	15,143	19,241	24,449
International	347	93	98	103	108	113	119	125	131	137	144	183	233
National	8,323	9,668	10,151	10,659	11,192	11,752	12,339	12,956	13,604	14,284	14,998	19,058	24,216
Non-Scheduled	11,658	14,399	15,119	15,875	16,669	17,502	18,377	19,296	20,261	21,274	22,338	28,383	36,066
International	9,196	11,157	11,715	12,301	12,916	13,561	14,239	14,951	15,699	16,484	17,308	21,993	27,945
National	2,462	3,242	3,404	3,574	3,753	3,941	4,138	4,345	4,562	4,790	5,029	6,391	8,120
General Aviation													
Military													
Cargo													
Mail													
Other													
TOTAL AIRCRAFT MOVEMENTS	20,328	24,160	25,368	26,636	27,968	29,367	30,835	32,377	33,996	35,695	37,480	47,624	60,514
Peak Aircraft Movements (Month)													
Peak Aircraft Movements (Arrivals)													
Peak Aircraft Movements (Departures)													
TOTAL AIRCRAFT PEAK MOVEMENTS													

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Charter International	84	95	99	104	110	115	121	127	133	140	147	184	230
Scheduled National	3,892	5,822	6,113	6,419	6,739	7,076	7,430	7,802	8,192	8,601	9,032	11,289	14,112
Mail (000 Kgs)													
TOTAL CARGO	3,975	5,917	6,212	6,523	6,849	7,192	7,551	7,929	8,325	8,741	9,178	11,473	14,341
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	12	12	12	12	12	20	20	20	20	20	20	20	20
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	22,727	22,727	22,727	22,727	22,727	37,878	37,878	37,878	37,878	37,878	37,878	37,878	37,878
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	8	8	8	8	8	18	18	18	18	18	18	18	18
Large (DC-10)	2	2	2	2	2	7	7	7	7	7	7	7	7
Medium (B-707)	6	6	6	6	6	11	11	11	11	11	11	11	11
Small (MD-83, 737)													
Remote positions	3	3	3	3	3	3	3	3	3	3	3	3	3
TOTAL PARKING POSITIONS	11	11	11	11	11	21	21	21	21	21	21	21	21
TERMINAL CAPACITY													
Annual passenger capacity (000)													
Arrivals per hour	900												
International													
National													
Departures per hour	904												
International													
National													
Peak month terminal utilisation													
Month													
Passenger throughput													

Airport: TENERIFE NORTE

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled (Arrivals)	997	1,204	1,264	1,328	1,394	1,464	1,537	1,614	1,695	1,779	1,868	2,384	3,043
International													
National	997	1,204	1264.471	1327.694	1394.079	1463.783	1536.972	1613.821	1694.512	1779.238	1868.199	2,384	3,043
Scheduled (Departures)													
International													
National													
Non-Scheduled (Arrivals)													
International													
National													
Non-Scheduled (Departures)													
International													
National													
Transit													
Transfer													
TOTAL PASSENGERS	997	1,204	1,264	1,328	1,394	1,464	1,537	1,614	1,695	1,779	1,868	2,384	3,043
AIRCRAFT MOVEMENTS													
Scheduled (Arrivals)	18,657	23,953	25,151	26,408	27,729	29,115	30,571	32,099	33,704	35,389	37,159	47,425	60,528
International													
National	18,657	23,953	25,151	26,408	27,729	29,115	30,571	32,099	33,704	35,389	37,159	47,425	60,528
Scheduled (Departures)													
International													
National													
Non-Scheduled (Arrivals)													
International													
National													
Non-Scheduled (Departures)													
International													
National													
General Aviation													
Military													
Cargo													
Mail													
Other	7,865	7,272	7,636	8,017	8,418	8,839	9,281	9,745	10,232	10,744	11,281	14,398	18,376
TOTAL AIRCRAFT MOVEMENTS	26,522	31,225	32,786	34,426	36,147	37,954	39,852	41,844	43,937	46,134	48,440	61,823	78,904
Peak Aircraft Movements (Month)													
Peak Aircraft Movements (Arrivals)													
Peak Aircraft Movements (Departures)													
TOTAL AIRCRAFT PEAK MOVEMENTS													

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Cargo	4,378	5,274	5,538	5,815	6,105	6,411	6,731	7,068	7,421	7,792	8,182	10,227	12,784
Mail (000 Kgs)	757,280	1,007	1,057	1,110	1,165	1,224	1,285	1,349	1,417	1,487	1,562	1,952	2,440
TOTAL CARGO	761,658	6,281	6,595	6,925	7,271	7,635	8,016	8,417	8,838	9,280	9,744	12,179	15,224
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	16	16	16	16	16	16	16	16	16	16	16	16	16
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991	42,991
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	9	9	9	9	0	0	0	0	0	0	0	0	0
Large													
Medium DC9	1	1	1	1									
Small - CN 235/ATR	9	9	9	9									
Remote positions	4	4	4	4									
TOTAL PARKING POSITIONS	13	13	13	13	0	0	0	0	0	0	0	0	0
TERMINAL CAPACITY													
Annual passenger capacity (000)	2,000	2,000	2,000	2,000	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Arrivals per hour	450	450	450	450	788	788	788	788	788	788	788	788	788
International													
National													
Departures per hour	450	450	450	450	788	788	788	788	788	788	788	788	788
International													
National													
Peak month terminal utilisation													
Month		August											
Passenger throughput PER HOUR		600											

Airport: TENERIFE SUR

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
PASSENGER MOVEMENTS (000)													
Scheduled (Arrivals)	561	468	492	516	542	569	598	628	659	692	727	927	1,183
International	113	70	74	77	81	85	90	94	99	104	109	139	178
National	448	398	418	439	461	484	508	533	560	588	618	788	1,006
Scheduled (Departures)	566	456	479	503	528	555	582	611	642	674	708	903	1,153
International	89	65	68	72	75	79	83	87	91	96	101	128	164
National	476	391	411	432	453	476	500	525	551	578	607	775	989
Non-Scheduled (Arrivals)	2,185	2,590	2,719	2,855	2,998	3,148	3,305	3,470	3,644	3,826	4,017	5,127	6,544
International	1,800	2,068	2,171	2,279	2,393	2,513	2,639	2,771	2,909	3,055	3,207	4,094	5,225
National	384	522	548	576	604	635	666	700	735	771	810	1,034	1,319
Non-Scheduled (Departures)	2,270	2,608	2,738	2,875	3,019	3,170	3,328	3,495	3,669	3,853	4,045	5,163	6,590
International	1,812	2,065	2,168	2,276	2,390	2,509	2,635	2,767	2,905	3,050	3,203	4,088	5,217
National	458	543	570	599	629	660	693	728	764	802	843	1,075	1,372
Transit	148	138	145	152	160	168	176	185	194	204	214	273	349
Transfer	0	0	0	0	0	1	1	1	1	1	1	1	1
Passenger Movements	5,729	6,260	6,573	6,902	7,247	7,610	7,990	8,390	8,809	9,250	9,712	12,395	15,820
AIRCRAFT MOVEMENTS													
Scheduled (Arrivals)	4,790	5,016	5,267	5,530	5,807	6,097	6,402	6,722	7,058	7,411	7,781	9,931	12,675
International	1,366	1,202	1,262	1,325	1,391	1,461	1,534	1,611	1,691	1,776	1,865	2,380	3,037
National	3,424	3,814	4,005	4,205	4,415	4,636	4,868	5,111	5,367	5,635	5,917	7,551	9,638
Scheduled (Departures)	4,773	5,003	5,253	5,516	5,792	6,081	6,385	6,704	7,040	7,392	7,761	9,906	12,642
International	1,353	1,230	1,292	1,356	1,424	1,495	1,570	1,648	1,731	1,817	1,908	2,435	3,108
National	3,420	3,773	3,962	4,160	4,368	4,586	4,815	5,056	5,309	5,574	5,853	7,470	9,534
Non-Scheduled (Arrivals)	16,164	18,448	19,370	20,339	21,356	22,424	23,545	24,722	25,958	27,256	28,619	36,525	46,617
International	11,538	13,205	13,865	14,559	15,286	16,051	16,853	17,696	18,581	19,510	20,485	26,145	33,368
National	4,626	5,243	5,505	5,780	6,069	6,373	6,692	7,026	7,377	7,746	8,134	10,381	13,249
Non-Scheduled (Departures)	16,183	18,455	19,378	20,347	21,364	22,432	23,554	24,731	25,968	27,266	28,630	36,539	46,635
International	11,566	13,151	13,809	14,499	15,224	15,985	16,784	17,624	18,505	19,430	20,402	26,038	33,232
National	4,617	5,304	5,569	5,848	6,140	6,447	6,769	7,108	7,463	7,836	8,228	10,501	13,403
General Aviation													
Military													
Cargo													
Mail													
Other	559	510	536	562	590	620	651	683	718	754	791	1,010	1,289
TOTAL AIRCRAFT MOVEMENTS	42,469	47,432	49,804	52,294	54,908	57,654	60,537	63,563	66,742	70,079	73,583	93,911	119,858
Peak Aircraft Movements (Month)	August	August											
Peak Aircraft Movements (Arrivals)	1,980	2,413											
Peak Aircraft Movements (Departures)	1,975	2,412											
TOTAL AIRCRAFT PEAK MOVEMENTS	3,955	4,825											

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2005	2010
CARGO (000 Kgs)													
Cargo	18,096	17,733	18,620	19,551	20,528	21,555	22,633	25,764	24,952	26,200	27,510	34,388	42,985
Mail (000 Kgs)	6,382	5,735	6,022	6,323	6,639	6,971	7,320	7,686	8,070	8,474	8,897	11,122	13,902
TOTAL CARGO	24,478	23,469	24,642	25,874	27,168	28,526	29,953	31,450	33,023	34,674	36,408	45,509	56,887
AIRPORT CAPACITY													
Declared Planning Capacity (Movements/hour)	20	20	20	20	20	20	20	20	20	20	20	20	20
Arrivals													
Departures													
Sustainable Movements Per Hour													
Practical Annual Capacity	48,865	48,865	48,865	48,865	48,865	48,865							
Average Delay (mins)													
Average Peak Month Delay (mins)(2)													
APRON CAPACITY													
Terminal area (number of positions)	25	25	25	25	33	33	33	33	33	33	33	33	33
Large A300	7	7	7	7	15	15	15	15	15	15	15	15	15
Medium (B-737, MD80)	17	17	17	17	17	17	17	17	17	17	17	17	17
Small	1	1	1	1	1	1	1	1	1	1	1	1	1
Remote positions	2	2	2	2	2	2	2	2	2	2	2	2	2
TOTAL PARKING POSITIONS	27	27	27	27	35	35	35	35	35	35	35	35	35
TERMINAL CAPACITY													
Annual passenger capacity (000)													
Arrivals per hour	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
International													
National													
Departures per hour	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300
International													
National													
Peak month terminal utilisation													
Month													
Passenger throughput (000)													

APPENDIX B
Trends in Passenger Handling

Congestion at airports, exacerbated by the introduction of wide body equipment and its increasing use on domestic and charter services puts a particular strain on passenger and baggage handling. Not only are more passengers being handled but they must also be handled in larger groups. Given the problems of scheduling and the vagaries of timekeeping, it is inevitable that movements of both aircraft and passengers show very marked peaks. The ability to handle large numbers of passengers and large volumes of baggage is therefore, at a premium.

The objectives of the airport operator are generally stated as being the ability to process both arriving and departing passengers in the minimum time consistent with imposing no operational delay on the airlines. It should be noted, however, that in the case of departing passengers this objective may be in conflict with the aim of making profits from duty free and other sales. To realise the primary objective of speedy passenger processing requires a concerted effort by the airport authority, public transport, the highway authority, the airlines and, in the case of IT traffic, the tour operators and other members of the tourist industry (coach operators, hotels etc.).

Good passenger and baggage handling starts with terminal design and will be reflected in the distances that passengers bave to walk, the provision of travelators as well as the simplicity and separation of traffic flows. All these intrinsic design features can however, be reinforced or under-mined by such simple yet important "direction" factors as signposting, flight information display systems (FIDS), public announcements etc..

The third important factor in efficient passenger handling after design and direction is management. Management in this context covers a variety of topics but may be described as the way in which services are provided within a given facility. An example of how management may differ is the way in which queuing for check -in is organized. Conventionally separate queues are formed for each check-in desk/clerk combination. This means, of course, that a delay in the processing of any individual passenger (due to misplaced ticket, ticketing error, over-booking etc.) affects all other passengers in the same queue. The alternative approach (the post office queue) is to have a single queue for a number of check in desks and as a clerk completes a passenger check-in the person at the front of the check-in queue goes to the vacant clerk. Generally this latter approach which has been widely adopted in a number of environments including post offices and financial institutions US airports but not, to date, European airports, can be shown to process people at a faster overall rate than multiple queues. Moreover, it has the effect of isolating "difficult" passengers (ie those whose checking is causing problems) so that their delay does not have a great impact on those behind them. Another example of management would be curbside baggage checking. This practice, widespread in the USA but uncommon elsewhere, requires special baggage handling facilities to be fully effective but can be introduced (especially at smaller airports) on a fully manual basis.

Curbside check-in does, of course, raise security issues and is only effective in speeding passenger flow where a significant percentage of the passengers check baggage and/or baggage handling is a noticeable element of the check-in delay. Nevertheless, as the American experience shows curbside check-in can help improve passenger flow in terminals and is generally popular.

The fourth factor in passenger flow control is information. The information needs of an airline in respect of departing passengers (i.e. people who would normally check-in) are obtained from the ticket (or more accurately a coupon drawn from the ticket). The passenger typically exchanges a coupon for a boarding pass which he or she surrenders in whole or in part when boarding the flight. The airline uses the check-in process to update its reservations system and as input to its departure control, weight and balance and other operational systems. The coupon is used for accounting purposes (revenue accounting) while the boarding card is used for passenger reconciliation. While this over-simplified summary may be complicated by the existence of Visa checking, departure taxes (where not consolidated into the ticket fare) and other factors, it does indicate that if it is possible to capture this data automatically or from other sources, the check-in process can be greatly simplified and in some cases eliminated. The most promising developments in this field are automated ticketing and boarding passes (ATB). ATB is being experimented with by a number of airlines and by the end of 1991 was already expected to account for approximately 30% of domestic tickets issued in the US. ATB exists in two forms ATB1 which is the predominant version in the US and ATB2 with additional data encoded into a magnetic stripe. Other possibilities which can speed departing passenger flow include off-airport check-in. Although some of the best known examples of this have been discontinued in recent years (e.g. BA's WLAT), it remains an approach which may be suitable in some circumstances and could be especially suitable for significant charter destinations.

With competition between airlines probably now greater than ever before and with deregulation or at least significant liberalization likely to enhance competition, airlines are more than ever anxious to establish their own brand image. Concomitant with this need, is the desire to ensure quality control of all aspects of product delivery. Thus increasingly airlines are, wherever possible, self handling and exerting pressure on airport authorities to permit self-handling.

Of particular concern in today's security conscious environment is the positive matching of baggage to boarded passengers and this is another area where information technology (this time in the form of bar-coding) can offer positive benefits in addition to its primary role of identification and tracing.

In summary then, the trends in airport passenger handling are basically aimed at controlling and separating flows of passengers and at capturing the necessary data relevant to passenger status (check-in, with/without baggage, boarded etc.) as early and as automatically as possible whilst conflicting objectives e.g. maximising airport sales opportunities may sometimes obstruct these trends, it is essential that they receive sufficient weight in airport planning if air travel is to retain its "premium" image and continue to attract the high yield leisure as well as the time pressed business traffic.