

Strategic Airport Planning

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United Kingdom – North America – Japan
India – Malaysia – China

Emerald Group Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

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British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

ISBN: 978-0-58-547441-0



Awarded in recognition of Emerald's production department's adherence to quality systems and processes when preparing scholarly journals for print



INVESTOR IN PEOPLE

LIST OF TABLES

Table 3.1	Styles of planning.....	46
Table 3.2	The strategic planning process.....	47
Table 3.3	UK airport annual passengers and growth by size class.....	54
Table 4.1	Percentage of short haul flights in western Europe and the USA by market type.....	75
Table 4.2	Comparative European hub performance.....	78
Table 4.3	General Aviation activity in the United States.....	86
Table 5.1	Economic impacts of two major US airports.....	105
Table 5.2	Monthly trips per employee in high technology industries.....	106
Table 6.1	FAA project appraisal weightings.....	150
Table 6.2	Criteria for evaluating projects.....	151
Table 6.3	Stand productivity per turnaround.....	159
Table 7.1	Travel choice model parameter comparison.....	181
Table 8.1	Passenger growth (%) at European airports, 1994/1993.....	203
Table 9.1	Flight Plan Phase III alternatives.....	265
Table 10.1	The Roskill Commission cost benefit analysis.....	276
Table 10.2	Comparative growth factors, 1994/1990 a) Scheduled b) Charter.....	284
Table 10.3	Traffic projections with and without expansion at Heathrow a) The base case b) The Heathrow option.....	293
Table 10.4	Seat factors and yields at Gatwick relative to Heathrow.....	302
Table 11.1	European airport runway capacity utilisation.....	332
Table 11.2	UK international scheduled traffic.....	337

LIST OF FIGURES

Figure 1.1	Historic trend in real fares.....	2
Figure 1.2	Worldwide traffic growth.....	2
Figure 2.1	Change in noise impact at Heathrow.....	23
Figure 3.1	Dimensions of airport system planning.....	41
Figure 3.2	The continuous planning process.....	44
Figure 3.3	Planning relationships.....	45
Figure 3.4	Risk criteria for communities around airports.....	66
Figure 4.1	The effect of hubbing on narrowbody turnaround times.....	96
Figure 5.1	Options for Manchester's new runway.....	123
Figure 6.1	Operating costs of UK airports, 1994/95 a) Operating expenditure b) Operating expenditure per work load unit.....	135
Figure 6.2	Operating surplus per work load unit.....	142
Figure 7.1	Conversion of Bergstrom Air Force Base, Austin, Texas.....	168
Figure 7.2	Typical ratios of annual to peak hour traffic.....	174
Figure 9.1	MSP 2005 noise contours - No action alternative.....	238
Figure 9.2	MSP airport configuration - No action alternative.....	239
Figure 9.3	Proposed MSP development alternative.....	245
Figure 9.4	Location of new airport alternative.....	246
Figure 9.5	MSP 2010 Long-Term Comprehensive Plan.....	248
Figure 9.6	MSP 2020 Concept Plan.....	249

Figure 9.7	Projected average aircraft delay at Seattle-Tacoma International Airport	255
Figure 9.8	Flight Plan Project Schedule.....	256
Figure 9.9	Forecast of air travel demand - Puget Sound Region.....	259
Figure 9.10	Locations of alternative airport sites - Puget Sound Region	264
Figure 10.1	The London area airports.....	274
Figure 10.2	Third parallel runway options for Heathrow	286
Figure 10.3	Cumulative percentage departures per week at Heathrow	287
Figure 10.4	Shares of London Airport passengers	297
Figure 10.5	Stansted shares of origin zone passengers	
	a) International scheduled trips through Stansted from surrounding zones	298
	b) International charter trips through Stansted from surrounding zones.....	299
Figure 10.6	Gatwick share of London domestic routes	300
Figure 10.7	Gatwick share of London international routes.....	301
Figure 10.8	Effect of frequency on Gatwick share of London short haul market.....	301
Figure 10.9	Regional shares of UK international markets	
	a) Scheduled passengers b) Charter passengers	309
Figure 13.1	Traffic at southern Scottish airports	373
Figure 13.2	Traffic at Belfast airports.....	374
Figure 13.3	Traffic at New York airports	376
Figure 13.4	Traffic at São Paulo and Rio.....	378
Figure 13.5	Traffic at Paris airports	379
Figure 13.6	Traffic at Montreal and Toronto	381
Figure 13.7	Shares of regional passengers	382
Figure 13.8	Liverpool shares of northwest passengers.....	383
Figure 13.9	Leeds/Bradford shares of northwest passengers	383

PREFACE

The aim of the book is to identify the strengths and weaknesses of past strategic planning of airport systems, and to attempt to provide guidance on how the concept of strategic system planning can be used to advantage in the future. It is an attempt to return to the ground which was so well covered some 20 years ago by Richard de Neufville in his book: “Airport System Planning”. The need to update and extend this work, as well as the challenge in doing so, arise from the subsequent changes in the structure of the air transport industry and the contexts within which it must work. The industry is increasingly becoming liberalised, privatised and globalised. However, the intended competition is sometimes seriously constrained by lack of physical and environmental capacity or by the economic forces that shape the behaviour of the operators. At the same time, the planning context is becoming more sensitive to sustainability issues and to calls for integrated transport solutions to address increasing levels of congestion.

The need for a strategic systems view has never been greater, as entrepreneurial stakeholders attempt to create and take advantage of their own comparative advantages. Those in government need to understand the system behaviour and the extent to which it may be necessary to intervene in the provision of facilities, and how air transport may best be fitted into other transport policies. Equally, the entrepreneurs need to understand what their natural roles may be and what they would need to do to move away from those roles.

The content of the book stems from studying past attempts to prepare national and regional strategic system plans in a variety of contexts, as well as from noting the lack of a systems context in many individual airport master planning studies. The ideas presented in this book have been honed by discussions with colleagues and students on postgraduate and short courses in Berkeley, Loughborough and ITA in Brazil, as well as numerous professional colleagues throughout the aviation industry, though all responsibility for these ideas rests with the authors. Among those at Loughborough who have influenced the work are Norman Ashford, David Gillingwater, Lloyd Jenkinson and David Pitfield. Colleagues at Berkeley whose work and ideas have shaped the thinking in this book include David Gillen, Mark Hansen and Adib Kanafani. Thanks go to them, to Henrique Gennari whose PhD helped to structure some of the strategic planning ideas, to Darren Rhodes for his PhD work on an integrated aircraft design model, and to all others whose work has been relevant, whether it is attributed in the text or has trickled into our consciousness in a less formal way. Thanks also to Mary Ashworth who compiled and formatted the text. Finally, thanks to those whose lives have been so disrupted by the prolonged production of the text, namely Anna Caves and Katie Korzun, without whose tolerance and good humour the task would never have been completed.

1

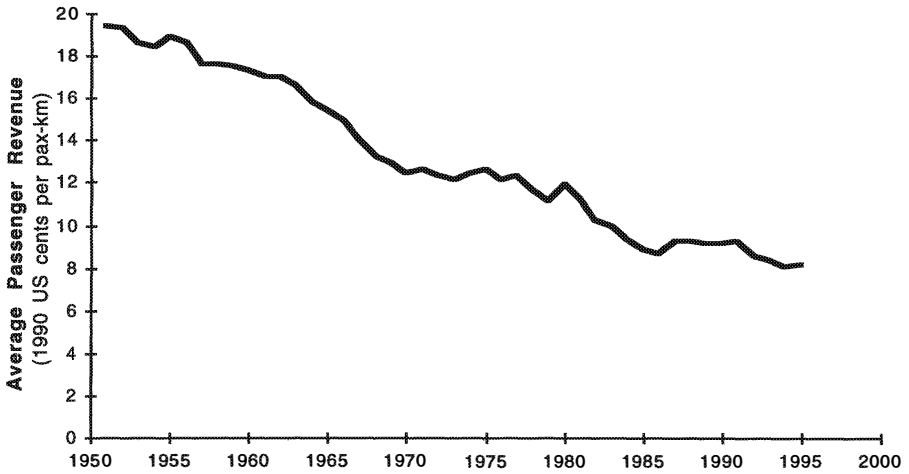
INTRODUCTION

Few things better characterise the changes in transportation and communication that have taken place during the twentieth century than the growth and changes in air transportation. In 1903 two bicycle mechanics and self-taught aeronautical engineers were able to achieve sustained powered flight for 40 yards at Kitty Hawk, North Carolina. At the time, the fastest train journey from Washington DC to San Francisco took over four days, while the transatlantic journey from New York to Hamburg took seven days. Today, aircraft have replaced both trains and ocean liners for all long distance travel, with everyone from diplomats to students routinely crossing oceans and continents in a matter of hours. Modern long haul aircraft can fly a third of the way around the globe without stopping. Nor are these changes restricted to passenger travel. A business package can be picked up in Los Angeles one afternoon and delivered in Paris two days later.

1.1 CONTEXT OF AIRPORT SYSTEM PLANNING

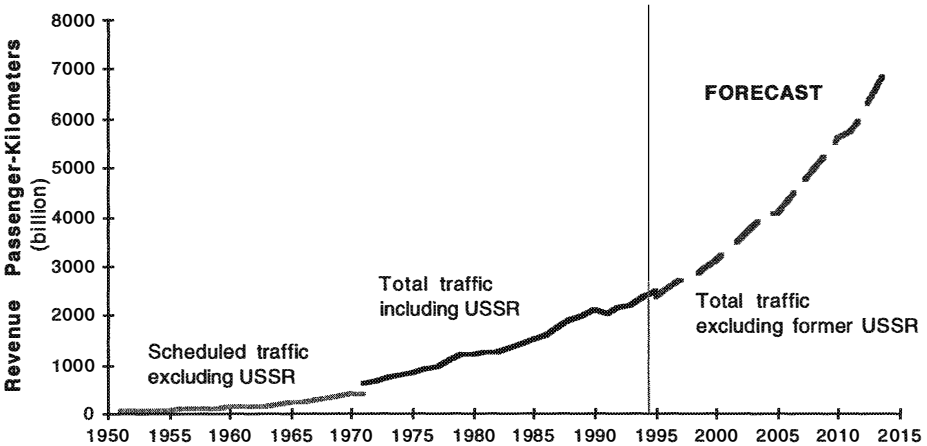
The advances in the technology of air transportation have been matched by a progressive reduction in its cost, as shown in Figure 1.1. Not surprisingly, these changes have led to a dramatic increase in air travel, which are projected to continue into the foreseeable future, as shown in Figure 1.2. Together with this growth in air travel has come the need for ever increasing airport capacity to handle this traffic. At first, airports were constructed in a somewhat ad hoc manner. As the technical requirements of successive generations of aircraft became clearer and the volumes of passengers and cargo being handled increased, the need for common and accepted procedures for airport planning become apparent, and a well-defined body of technical literature emerged, supported by the standardising influence of such agencies as the International Civil Aviation Organisation and United States Federal Aviation Administration.

Figure 1.1: Historic trend in real fares



Source: International Civil Aviation Organisation, ICAO Bulletin; Civil Aviation Statistics of the World, various annual issues.

Figure 1.2: Worldwide traffic growth



Sources: International Civil Aviation Organisation, ICAO Bulletin; Civil Aviation Statistics of the World, various annual issues.
Douglas Aircraft Company, 1996.

However, these procedures and guidance material largely focus on the planning of individual airports. The interaction between airports, and the planning of airports at a regional or national level, has been less well defined and given much less attention. Even so, over the past three decades the need to plan individual airports within the context of the airport system as a whole has become more widely recognised. This has been driven largely by two concerns. The first is the emergence of national or statewide funding programmes to support airport development, and the consequent need for a systematic approach to allocating that funding among the many eligible airports. The second concern is the emergence of systems of multiple airports serving large metropolitan regions. As air traffic has increased beyond the point where it can be handled by a single airport, or simply due to the geographical extent of the region, the traffic has become distributed between several airports.

Travel and tourism, much of it using air travel, now employ more than 10% of the world's workforce and generates the same percentage of the world's Gross Domestic Product. Similarly, a large proportion of the world's freight value is moved by air. The air transport industry estimates that the total impact on the world economy in 1992 was US \$1,000 billion and accounted for 22 million jobs (ATAG, 1993). A recent survey by the Airports Council International showed that 85 of their members operated 246 airports which handled 40% of world passengers, employed 71,000 people and generated some US \$11.4 billion in 1995, half of which came from non-aeronautical sources (ACI, 1997). This activity is generated by the travel habits of a very small proportion of the world's population. Hardly any of the two billion Chinese or Indians have flown, and even in the United States, where air transportation is widely used for domestic travel, only 15% of US citizens hold a passport (Lovett, 1995). Increasing wealth and lower prices will cause continuing increases in demand. The International Civil Aviation Organisation (ICAO) reports that passengers carried have been increasing at 5.0% and air transport movements (atm) at 3.5% per annum worldwide for the last decade.

The world's most mature air travel market is the US, but its traffic is still expected to increase at 4.0% annually. This will call for very large absolute increases in capacity, even at the busiest airports. While the average passenger growth of all the member airports of the Airports Council International (ACI) was 5.0% in 1997, the growth at the four airports with the greatest number of passengers, namely Chicago O'Hare, Atlanta, Dallas Fort Worth and Los Angeles was 1.8%, 7.7%, 4.2% and 3.7% respectively (ACI, 1998). Their average traffic growth of some 3 million passengers per annum (mppa) was therefore greater than the total 1997 traffic of such airports as Adelaide, Christchurch, Madras, Ankara, Faro, Larnaca, Milan Malpensa, Prague, Brasilia, Guadalajara, or Oklahoma City. Until the recent economic setbacks, the highest growth rates have been occurring in the developing world, particularly in Asia and the Pacific Rim, as these countries climb towards a level of income of US \$10,000 per capita. Traffic in China has been growing at over 20% per year for two decades. These countries are beginning to feel the environmental constraints which have been a prime concern in the western world for the last two decades, as cities expand into the area around their airports. Though only Seoul is in the world's busiest 10 airports, and only Bangkok, Taipei, Jakarta, Beijing and Kuala Lumpur are in the top 50, many cities are considering expensive and remote sites for new replacement airports to support the further expansion of traffic, in air freight as well as passengers.