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IMPLICATIONS OF AIRLINE CODESHARING

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FOREWORD

In a rapidly changing global economy, the international air transport industry must continuously find new ways to adapt to trends and to changing and increasingly competitive conditions. Codesharing and other related forms of airline co-operative ventures have been adopted by many international carriers either to extend their global reach or simply to survive in the more competitive environment, enabling them to be better placed in the marketplace. Such agreements have proliferated in the past years and the recent trend shows no sign of abatement. Not all carriers have embraced codesharing, however, and the practice has been contested by some. Because codesharing involves much more than simple marketing or operational techniques, its wide application raises a certain number of potential regulatory concerns, mainly on the consumer and competitive aspects. Such developments have focused the wider attention of the aeronautical community on codesharing and at the same time generated a number of national and regional studies, some of which are still under way.

When the ICAO World-wide Air Transport Conference convened in Montreal from 23 November–6 December 1994 to explore the future regulatory framework of international air transport, it identified a number of aspects on which further studies were needed. Codesharing was among the topics selected to be examined by the Organization. This study was prepared by the Secretariat in 1996, drawing on available published information, including estimated 1995 data where necessary, specific studies already published for the Governments of the United States and Germany as well as for the European Commission, and ICAO's own documentation and research, with input provided by the European Civil Aviation Conference (ECAC) and by different Contracting States.

Since codesharing is a relatively recent phenomenon — at least in its international application — and the situation is constantly evolving, any study on the subject is liable to be quickly overtaken or outdated by new factors. Moreover, the recentness of some of the agreements makes it difficult, in certain instances, to obtain any useful perspective on their results. Subject to these reservations, this study examines the present situation, seeks to address comprehensively the implications of codesharing and identifies certain areas where caution should be exercised by regulatory authorities.

This study has been approved by the Secretary General and published under his authority.

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EXECUTIVE SUMMARY

1. Codesharing and other related forms of airline co-operative ventures have been increasingly adopted by many international carriers to adapt to new trends such as the globalization of businesses as well as the increasingly competitive conditions that are now prevalent in the air transport industry. Because codesharing involves much more than a simple marketing or operational technique, its wide application raises a certain number of potential regulatory concerns.

2. The practice of codesharing, by which one carrier permits a second carrier to use its airline designator code on a flight, or by which two carriers share the same airline code on a flight, can take different forms. It may, for example, involve a major carrier sharing its code with a smaller feeder carrier; it may also be an arrangement between two or, in some instances, three or more international carriers for an international flight operated co-operatively or for a connecting service which uses the same code.

3. Other airline practices, such as blocked space, wet leasing, franchising, joint service and pooling, are often closely associated with codesharing and sometimes receive similar regulatory treatment (see Chapter 1).

4. For purposes of this study, the effects of airline codesharing on traffic development have been assessed — on a preliminary basis because of the recentness of the experiences — on a certain number of routes involving transatlantic crossings for which sufficient data were available. The main findings are that, with a few notable exceptions, in most of the city-pairs examined, codesharing arrangements have not as yet produced fundamental changes in the markets considered. Where changes have been brought about, it has tended to result in a reduction in competition, in terms of the number of operators present in the market, and a reduction in the number of services offered to the public. Because in most of the cases they are the actual carriers under the codesharing agreements, European carriers as a group would appear, on the basis of the data reported, to have fared better than North American carriers as regards improvement of their market share (see Chapter 2).

5. Quantifying the economic benefits derived from the practice of airline codesharing is a difficult exercise and the validity of the results provided in some studies or by participants in such schemes has been challenged. In some cases, airlines that are party to a broader alliance have clearly benefited from the practice in terms of additional traffic and extra revenue, although this has mainly been at the expense of other carriers, since there is no clear evidence of traffic stimulation but rather of traffic redistribution. In some other cases, there may be occasions when, within the context of an alliance, the codesharing arrangement may have the effect of benefiting only other carriers and other countries, since services are exclusively operated by the other party, with possible negative effects on employment and revenue for the first party. For airports and passengers alike, codesharing *per se* will not automatically be beneficial in every situation; on the other hand, when circumstances are favourable, it could be of value for airport operators and the travelling public. However, it remains to be seen how the situation will evolve in the long run if, on a given sector that has a number of operators competing on it, most competitors have either been forced out and/or become part of an alliance, and the market has tended to concentrate (see Chapter 3).

6. Airline codesharing may have advantages for developing countries in so far as it can offer the possibility of serving very thin routes at minimal cost and using heretofore unused rights. It can thus be an instrument to facilitate the participation of developing countries' airlines in international air transport. However, the present situation shows that the practice has yet to take hold in a substantive way among developing countries' airlines, although this may

change as the potential benefits of this form of co-operation come to be viewed as a means of adapting to the changing competitive environment and of enabling developing countries' airlines to participate more economically and effectively in international air transport (see Chapter 4).

7. Airlines' attempts to increase their market access and exposure through commercial alliances have placed codesharing under considerable regulatory attention since it was perceived as a means of indirectly increasing market access. It is now the general practice that international codesharing is dealt with in the bilateral negotiating process and that underlying traffic rights are required in order for any codeshared service to be approved. In some cases, specific provisions in bilateral agreements may also be required for codeshared services, especially when a third country is involved.

8. Therefore, other than its link to underlying traffic rights, codesharing does not have a systematic regulatory treatment, but rather an ad hoc treatment dictated by general aeropolitical considerations. Thus far, this has tended to be a reactive — in some respects, protective — treatment, rather than being based on a more strategically planned or longer-term vision of future policy evolution or aeronautical relationships. Paradoxically, a reliance on codesharing as a means to greater market access, while increasing competition in some circumstances, can in other circumstances actually impede the development of a truly liberalized air transport regulatory framework through limitations on frequencies for codesharing services and, in particular, any multilateral approach to liberalization (see Chapter 5).

9. Codesharing raises the issue of competition in two ways, either as an enhancement of competition through the provision of additional or better service or as a reduction of it through a concentration of the forces playing in the market. Because of the lack of appropriate data and relatively limited experience, the longer-term effects of codesharing on competition are still uncertain. Nevertheless, one conclusion that can be drawn so far is that the potential pro- or anti-competitive aspects of a proposed codesharing operation need to be weighed carefully on a case-by-case basis. With the proliferation of codesharing agreements, there is likely to be increasing resort to competition laws by aeronautical authorities to provide criteria for such assessments. For most countries, it can be expected that, notwithstanding this competition law aspect, the broader aeropolitical and regulatory objectives often associated with codesharing will continue to be pre-eminent considerations (see Chapter 6).

10. Codesharing may give rise to uncertainties concerning carrier liability. Two important legal issues are posed by codesharing: which air carrier is liable under the Warsaw régime and which air carrier is responsible to the passenger in user/consumer-related matters? In the case of the former, it would appear that codesharing, when it involves a connection, need not necessarily be equated to successive carriage such as in the usual case with interlining, but that ultimate legal responsibility could nonetheless be determined by the contract of carriage between the passenger and the contracting carrier, depending on the interest of the passenger or its claimants. Where the codeshared service does not involve successive carriage, then other legal considerations concerning the right of liability redress may arise. With respect to responsibility to user-related issues, the usual airline industry rules and practices would apply, i.e. responsibility rests with the operating carrier. In any event, before engaging in providing services, codesharing partners should meet certain requirements, i.e. agree on liability issues and give notice to the public, so that these become part of the terms and conditions of carriage (see Chapter 7).

11. The consequences of codesharing for the consumer raises the questions as to whether it is a deceptive practice or, alternatively, whether it is beneficial to the consumer. The over-all concern is that information on actual or potential travel given to the travelling public must be accurate and complete and not confusing or in any way misleading. Hence, better information and a measure of consumer protection have been widely advocated. There is now a general recognition that the information provided to the public on codeshared flights is in many instances not sufficient and needs to be improved. If the solution to be adopted is one of placing the burden of responsibility for taking action at the industry level, i.e., mostly on airlines but also on travel agents and others in the information chain, then information to passengers should be provided in the following three ways:

- orally, at the time of booking;

- in written form, i.e. on the ticket itself and/or (if not possible), on the itinerary document accompanying the ticket, or on any document replacing the ticket, such as a written confirmation, including information on whom to contact if problems arise and a clear indication of which airline is responsible in case of damage or accident; and

- orally again, by the airline's relevant airport ground staff at all stages of the journey.

12. Caution is necessary when judging the benefits to the travelling public claimed for the practice of airline codesharing, and the elements of quality of service, flight options and tariffs will be pivotal to any assessment of benefit. The simple fact of a service being codeshared will not automatically result in a better air service than an interline or non-stop one, and each case will need to be judged on its merits (see Chapter 8).

13. The implications of codesharing upon labour are felt mainly at two levels. At the work force level, some airlines may be affected by redundancies, and at the management level, management and staff will need to adapt to new working conditions, possibly to learn new skills and finally to be left with the challenge of making the theoretical or desired benefits work in practice. Thus, the over-all labour context is one of added pressure put on staff by the new trends affecting the industry. However, motivated employees clearly have an influence on airline performance, and their attitudes are of the utmost importance in the relationship between airlines and their passengers. It will therefore be in the interest of all parties concerned to give due consideration to staff concerns during the process of alliance-making, which incorporates codesharing, and in its implementation (see Chapter 9).

14. Clear lines of accountability and responsibility are essential for security/facilitation aspects as well as for safety aspects, since technical and operational regulations may vary considerably from one airline partner in a codesharing arrangement to another, depending on their countries of registration. In terms of environment, the codesharing practice may have both positive and negative aspects in so far as it has the potential of creating new aircraft movements or reducing them (see Chapter 10).

Chapter 1

DESCRIPTION OF CODESHARING AND ITS CONSEQUENCES

DIFFERENT TYPES AND FORMS OF CODESHARING

1.1 Codesharing is the practice whereby one carrier permits a second carrier to use its airline designator code on a flight, or where two carriers share the same airline designator code on a flight[1]. In its application, passengers actually fly on an airline other than the one identified on the ticket. Codesharing thus involves one airline advertising and selling the services of another airline as its own. Consequently, the use of codesharing permits the offer and sale of transportation services involving more than one airline (which would normally be considered as "interline") as if they were transportation services on one airline (which is the characteristic of "on-line"). Thus, from the codesharing airlines' perspective, it is a form of "preferential interlining".

1.2 There are different forms of codesharing. It may, for instance, involve a major carrier sharing its code with a smaller feeder carrier, usually a regional/commuter airline, which may or may not be owned by the major carrier. It could also be an arrangement between two or, in some instances, three or more carriers based in different countries for a flight operated co-operatively, such as a joint venture flight, or for a connecting service which uses the same code.

1.3 In understanding codesharing, it may be useful to distinguish between "codesharing" *per se* and more sophisticated alliances which involve more aspects than just codesharing. In "simple codesharing" each airline operates independently on every aspect other than putting one airline's code on another's flight. It would, however, require an agreement as to what share of the revenue goes to the actual operator and what share goes to the seller of the ticket. When codesharing is part of a broader strategic alliance, there may be co-operation in many other aspects (see also 1.7 to 1.9), many of which may, in combination, have a greater impact than simple codesharing; for example:

- blocked-space
- co-operation in baggage and/or ground handling
- co-ordination in flight scheduling
- co-ordination in frequent flyer programmes
- co-ordination in in-flight service
- co-ordination in maintenance services
- co-ordination of major purchases, such as fuel, insurance and on-board equipment
- exchange of equity
- franchising
- joint venture
- joint marketing
- sharing of airport facilities

1. More precisely, the *Manual on the Regulation of International Air Transport* (Doc 9626) defines codesharing as *"the use of the flight designator code of one air carrier on a service performed by a second air carrier, which service is usually also identified (and may be required to be identified) as a service of, and being performed by, the scond air carrier".*

1.4 Agreements on these other areas of co-operation can, of course, be achieved without a codesharing agreement. However, in practice, codesharing usually represents a further commitment. This does not mean, however, that by their nature codesharing agreements will be successful or long-lasting, and the success, particularly when it includes other more substantial forms of co-operation, will eventually depend on planning, corporate will and execution, as well as the perceived and actual benefits that derive from it.

1.5 A codeshared flight can be identified in different ways. It may have the same designator code with different flight numbers, or two or more codes with the same number. It could also be shown as a through service with the same code and same number even when there are aircraft and carrier changes en route. Finally, it may be that the same flight uses two or more codes and two or more numbers.

1.6 The following are some examples of international codesharing services that were found in airline timetables, airline guides or computer reservation systems in the summer season of 1995:

- between Ho Chi Minh City (Viet Nam) and Hong Kong on Cathay Pacific flight CX*766[2] (actually operated by Vietnam Airlines under flight number VN766), or between Teheran (Iran) and Vienna (Austria) on Iran Air flight IR*774, which is actually operated by Austrian Airlines (OS774), or between Zurich (Switzerland) and Nairobi (Kenya) on Kenya Airways flight KQ*292, which is actually operated by Swissair (SR292); these are examples where flight numbers are identical, but airline codes are different;

- between Ouagadougou (Burkina Faso) and Abidjan (Côte d'Ivoire) on Air France flight AF*7736, which is actually operated by Air Afrique (RK123), or between Budapest (Hungary) and Rome (Italy) on Alitalia flight AZ*1201, which is actually operated by Malev (MA400); these are examples of different codes and different flight numbers;

- airlines can take advantage of these codeshared flights on one leg to offer "on-line" connections to other points: for example, Alitalia will combine its AZ*1201 flight with AZ1790 to offer service from Budapest to Tokyo (Japan), or Cathay Pacific will combine its CX*766 flight with CX500 to offer service from Ho Chi Minh City to Tokyo; similarly, by combining flights SN*124 (operated by Delta Airlines as DL124) and SN527, Sabena is able to offer service from Atlanta (Georgia, United States) to Dakar (Sénégal) through its Brussels hub; these are examples of codesharing services that amount to so-called "Sixth Freedom" services;

- other examples of "on-line" connections: between San Francisco (California, United States) and Glasgow (United Kingdom) through United Airlines flights UA930 (to London-Heathrow) and UA*1930 (from Heathrow to Glasgow) (which is actually operated by British Midland Airways (BD002)); or between Los Angeles (California, United States) and Glasgow through American Airlines flights AA136 (to London-Heathrow) and AA*6006 (from Heathrow to Glasgow) (which is actually operated by British Midland Airways (BD006)); but when a passenger wishes to go from Boston (Massachusetts, United States) to Glasgow, using American Airlines flight AA108 to Heathrow, the connection to Glasgow will be offered under BD flight number 002, and not under an AA* flight number, although there is a codesharing agreement between carriers AA and BD (as well as between UA and BD, and for the same routes), the reason being that this flight is already marketed under a UA* flight number. In these examples, it can be seen that a certain similarity may exist between flight numbers used on different legs, but not in all cases;

- codesharing arrangements can become complicated with an increase in the number of points served on the same flight and an increase in the number of partners: for example, the flight linking Mauritius (MRU) to

2. All airline codes used in this study are IATA two-character designators (in usual practice, an asterisk alerts the reader when the airline indicated is not the operating carrier).

Nairobi (NBO), via St. Denis-de-la-Réunion (RUN) and Moroni (HAH) (Comoros), which is operated by carrier Air Austral (UU) and marketed under the following flight numbers, depending on the city-pairs concerned and the underlying traffic rights: MRU-NBO, MK*534; MRU-RUN, MK*534 and UU534; MRU-HAH, MK*534; RUN-HAH, UU534; RUN-NBO, AF*4534; HAH-NBO, MK*534 and UU534; in that case, it is fortunate that flight numbers are similar;

- example of through service with same code and flight number, although involving aircraft and carrier change en route: between Vancouver (YVR) (Canada) and Sydney (SYD) (Australia), which is offered under either Canadian Airlines flight CP*1035 or Qantas flight QF*4, and is actually operated by Canadian with DC-10 equipment between YVR and Honolulu (HNL), and by Qantas with B-747 equipment between HNL and SYD.

1.7 Other airline practices which are closely associated with codesharing include the following: ***blocked space*** and codesharing arrangements are usually, but not always, found together. Blocked space occurs when a number of passenger seats and/or specified cargo space are purchased by an air carrier for the carriage of its traffic on an aircraft of a second air carrier. Blocked space predated codesharing as a practice and was used to optimize available capacity, but it tended to evolve into codesharing arrangements. ***Wet leasing***, which is the leasing by an airline of an aircraft with its crew from another airline or a leasing company, is usually equated to codesharing, particularly when it is a long-term lease, as far as the requirements for providing information to the public and the holding of underlying traffic rights are concerned.

1.8 Closely related to codesharing in a conceptual way is the practice of ***franchising***, i.e. the granting by an air carrier (the franchiser) of a franchise or right to use various of its corporate identity elements (such as its flight designator code, livery and marketing symbols) to a franchisee. In marketing and delivering its air service product, the franchisee is subject to standards and controls intended to maintain the quality desired by the franchiser.

1.9 Also related are ***joint service*** flights and ***pooling*** arrangements, which involve flights identified by the designator codes of two airlines that typically have agreed to share revenues and/or costs, *inter alia*. Some States consider these forms of co-operation between carriers as codesharing and some do not. Pooling is a traditional form of inter-carrier co-operation, often sanctioned or even required by bilateral governmental agreements and usually motivated by capacity considerations; its usage, however, is now more often superseded by alliances that involve codesharing.

RATIONALE FOR CODESHARING

1.10 From the carriers' perspective, the main reasons for codesharing are:

- to achieve better display position in computer reservation systems, in cases where it is treated as an on-line service with a higher priority in listing than interline service;

- in the context of an increasingly competitive environment, to form some kind of co-operative links with other carriers to maintain, protect and improve their positions in the market;

- to achieve better presence on routes they do not fly, by means of an inexpensive marketing tool;

- to enable joint operation carriers to operate a viable service where traffic volumes do not justify individual operations by the two carriers;

- to obtain feeder traffic;

- to remain competitive or, in some cases, to enhance competitive position by drawing traffic within the orbit of codesharing partners; and

- to obtain increased market access to points hitherto restricted by capacity provisions in bilateral air services agreements.

For examples of codesharing in different contexts, see Figures 1-1, 1-2 and 1-3.

1.11 From the passengers' perspective, the advantages possibly derived from codeshared flights are:

- the convenience of co-ordinated schedules which may allow for good connections, with, for example, a greater chance that a connecting flight will wait if necessary;

- possible shorter elapsed journey time;

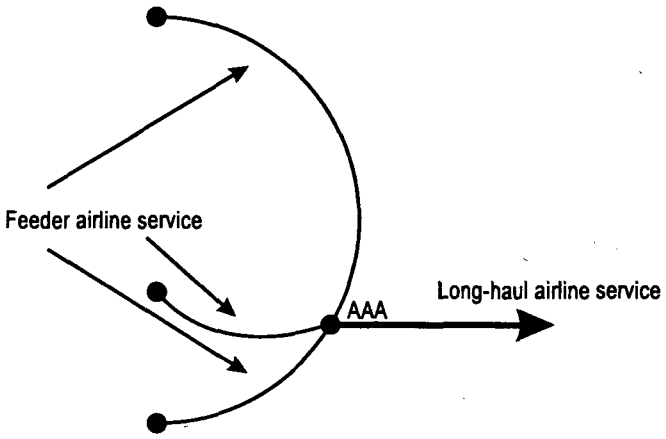
- shared terminals between partner carriers which may facilitate transfer of passengers and baggage;

- the possibility of lower fares than with traditional interlining, or at least through fares with a greater choice of special fares;

- single carrier supervision of the through journey which gives the image of a "seamless" product; and

- common frequent flyer programmes.

Object: To bring feeder traffic to gateway AAA for connection to onward points beyond AAA.
Examples: Air Canada Connectors, British Midland with different American and European Carriers.



Note.— The feeder airline may or may not use its own designator code on the feeder segment. The feeder segment may be offered to the public under many different airline codes, since it may be feeding a number of different airlines and routes.

Figure 1-1. Feeder service (also called "regional alliance")

Object: To operate services between BBB and CCC under a co-operative arrangement.

3 cases:

- one carrier operates the service with its own aircraft and sells seats to a second carrier which in turn resells these seats to the public (blocked space arrangement);
- the service is jointly operated by two carriers, with only one carrier actually operating the aircraft;
- the two carriers may also be operating their own aircraft on different days of the week (or different times of the day) and seats are sold to the other carrier during the periods where it is not operating its own aircraft.

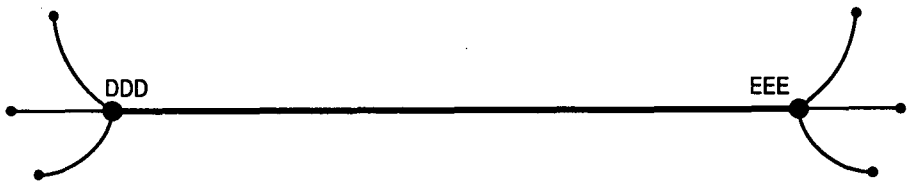
Examples: Delta/Air Portugal
Air Canada/Iberia
VIASA/Aerolineas Argentinas
TAROM/Turkish Airlines
Aeroflot/Austrian
Thai/Malaysia
Air Afrique/South African Airways
Air Pacific/Qantas

Note.— Pre- and post-gateway segments are not concerned with these arrangements, although they obviously bring and distribute traffic at each gateway (see Figure 1-3).

Figure 1-2. Gateway-to-gateway service (also called "point specific alliance")

Object: To operate all services between DDD and EEE and points beyond both gateways under a single airline designator code.

Examples: KLM/Northwest and Lufthansa/United.



Note.— Aircraft are actually operated by one or both carriers. Depending on the underlying traffic rights, double airline codes may not be offered on some of the beyond gateway services.

Figure 1-3. Gateway-to-gateway and pre- and post-gateway service (also called "strategic alliance")

PRACTICAL CONSEQUENCES FOR AIR CARRIERS, AIRPORTS AND COMPUTER RESERVATION SYSTEMS

1.12 Since codesharing is a commercial partnership between two or more air carriers, its negotiation and implementation can be complex processes. For instance, in many codesharing agreements, there will be a need to agree on certain essential elements which may include but are not limited to the following:

- What is the size of the respective seat blocks?
- Can the size of the seat block be expanded if one airline receives more bookings than it has space for?
- How is space assigned on the block of each airline to different fare categories?
- What are the policies to be followed on overbooking and compensation for denied boarding?
- Are the two airlines free to follow different strategies within their respective seat blocks?

1.13 Other questions of a more general nature may also need to be addressed, particularly from the financial viewpoint. These are:

- How is the revenue to be divided, including that for those passengers who travel on either of the partners beyond the codeshared segment?
- Should there be provision for minimum and maximum payments?
- What are the possible provisions for cost-sharing?
- Is it feasible (or possible) to have potential extensions of the agreement to other commercial or technical aspects such as frequent flyer programmes, ground handling, marketing, and joint exposure to the public through advertising?

1.14 In airports, signposting is a complex issue to solve for the codesharing practice because it requires that the relevant information on codeshared services must be provided inside and possibly outside the terminal. The goal for airports authorities is to avoid passenger confusion which could arise from codesharing by identifying the proper operating carrier, which may or may not be the name indicated on the passenger's ticket. This problem is further complicated in multi-terminal airports where signposting for all carriers involved in codesharing operations may be lacking or when a single airline codeshares with many different partners. Inherent in the airport signposting issue is the need to avoid overloading flight display boards and screens.

1.15 The main issue for the display of codesharing services in computer reservation systems is the so-called "screen padding", by which the same service using different airline designation codes and flight numbers may appear a great number of times, creating confusion for the consumer and unduly occupying space on the screen, with the consequence that other competing services are relegated to remote screens (see Figure 1-4).

From city ABC to city JKL, through cities DEF and GHI, codesharing airlines are XX, ZZ (*in usual practice, an asterisk alerts the reader when the airline indicated is not the operating carrier*).

Airline XX actually operates the ABC-DEF leg, and airline ZZ operates the DEF-GHI and GHI-JKL legs. As a result of the codesharing agreement between the two airlines, XX markets the DEF-GHI and GHI-JKL legs under its own code, and ZZ markets the ABC-DEF leg under its own code. Thus both airlines can offer service from end to end.

On CRS screens, the following information may appear (in sequence: first leg, flight number, second leg, flight number, third leg, flight number):

ABC-DEF: **XX123**	DEF-GHI: **ZZ321**	GHI-JKL: **ZZ555**, and/or
ABC-DEF: **XX123**	DEF-GHI: **XX*1500**	GHI-JKL: **ZZ555**, and/or
ABC-DEF: **XX123**	DEF-GHI: **XX*1500**	GHI-JKL: **XX*3400**, and/or
ABC-DEF: **XX123**	DEF-GHI: **ZZ321**	GHI-JKL: **XX*3400**, and/or
ABC-DEF: **ZZ*8123**	DEF-GHI: **ZZ321**	GHI-JKL: **ZZ555**, and/or
ABC-DEF: **ZZ*8123**	DEF-GHI: **ZZ321**	GHI-JKL: **XX*3400**, and/or
ABC-DEF: **ZZ*8123**	DEF-GHI: **XX*1500**	GHI-JKL: **ZZ555**, and/or
ABC-DEF: **ZZ*8123**	DEF-GHI: **XX*1500**	GHI-JKL: **XX*3400**

In reality, such a service would not be found eight times on CRS screens but may nonetheless be found four or even five times. However some CRSs, such as in Europe, may be restricted by regulation to limit the number of displays to two only.

Figure 1-4. Example of screen padding on a three-leg journey

Chapter 2
EFFECTS ON TRAFFIC DEVELOPMENT

PURPOSE AND METHODOLOGY

2.1 This chapter attempts to assess the actual effects which codesharing arrangements have had on the development of traffic between city-pairs where it is extensively used. As a starting point in any approach to codesharing, its findings will be relevant to an examination of the issues of market access and competition.

2.2 Many factors other than codesharing will influence traffic development on a particular route. Nevertheless, an examination of published traffic figures may identify significant changes which may have occurred and which could be attributed in whole or part to the presence of a codesharing arrangement. The aim is to assess whether the codesharing agreement may have been responsible for a change in the trend of traffic growth and in terms of added or reduced competition, for any increase or decrease in flight frequencies or capacity offered to the public, or for any changes in airline market shares.

2.3 In order to provide as broad a picture as possible, traffic flow statistics should ideally have been examined on several sets of routes, in different geographical regions. Since most of the agreements are recent, however, it has generally not been possible to obtain the relevant data except for transatlantic routes where, given the number and variety in scope of the agreements concluded and implemented, an analysis provides a useful insight.

2.4 For each city-pair examined, the following methodology is used. A statistical series of traffic data over the last ten years is analysed to give an idea of the general traffic development pattern on the route. Using published information on airlines operating the services and any changes that occurred in market shares between these different airlines, a comparison is made between possible "abnormal" variations and the actual introduction of codeshared services on the route. Conclusions are drawn mainly from the comparison between the "with codesharing situation" (the airline service operated under a codesharing agreement) and the "without codesharing situation", (the airline service operated the traditional way (by each airline independently)).

2.5 The group of routes analysed was between Europe and the United States, one of the most heavily travelled traffic flows in the world. On this sector, twenty codesharing agreements were concluded and approved between 1988 and 1994, encompassing, in some cases, several different routes. A number of the agreements, however, were excluded from the analysis: six because they were initiated in late 1994 only and two because approval was still pending at the time of writing. Twelve of these agreements, covering 42 different transatlantic city-pairs for which a sufficient amount of data was available, were thus analysed in detail. Given the volume of data handled, not all tables for all routes are reproduced in this study, and only one sample is provided (see Appendix 1).

MAIN FINDINGS

2.6 Statistics from the sample analysed show that on each side of the Atlantic approximately the same number of airports (15 or 16) is involved with routes operated under codesharing agreements. For the United States, 68 per cent of all such services (with 31 per cent for New York only) are concentrated at five airports. For the European side, codeshared services are just slightly more spread over the different airports involved; however, 63 per cent of

these services (with 26 per cent for Amsterdam only) are concentrated at four airports. It should also be noted that at the time of preparation of this study, two of the three main transatlantic markets (Paris-New York and Frankfurt-New York) have to date not been involved in codesharing agreements, and the major one in terms of traffic and services (London-New York) has only been marginally involved. Of all the codesharing agreements analysed, a majority (48 per cent) was introduced in the general context of increasing traffic, but a significant minority (31 per cent) was introduced in declining markets.

2.7 The main findings drawn from Table 2-1 are shown in the following boxes, which, of necessity, relate only to certain gateway city-pairs in these particular markets.

Has the introduction of codesharing agreements resulted in a strong traffic increase?
The answer to this question is no in 45 per cent of the cases and yes in 40 per cent (with 15 per cent where it is too early to know). The effect of codesharing on traffic development has therefore mixed results thus far. This is confirmed by the fact that even in cases where positive changes were recorded, exactly the same number of positive changes was found in already growing markets as in declining maarkets or markets with no apparent trend.

Has the introduction of codesharing agreements resulted in more or less competition?
In 74 per cent of the cases, for the city-pairs concerned, the competitive situation interms of the number of operators has remained unchanged, but where it has changed, it has been in the direction of reducing competition (26 per cent) rather than increasing it (0 per cent).

Has the introduction of codesharing agreements resulted in more or less services being offered to the public?
In 57 per cent of the cases, the situation remained unchanged. In 29 per cent services where reduced and in 14 per cent they were increased.

Which airlines benefited most from the introduction of codesharing agreements in terms of market share?
Based on the data filed, there was no change in 52 per cent of the cases. European airlines benefited most in terms of market share in 38 per cent of the cases and United States airlines in the remaining 10 per cent.

2.8 From the above and Table 2-1, it can be seen that, with a few notable exceptions (Amsterdam-Detroit, Amsterdam-Minneapolis/St. Paul, London-Philadelphia), in most of the city-pairs codesharing agreements have not as yet produced fundamental changes in the markets considered. Such results are preliminary, however, and in several instances it is still too early to draw significant conclusions[1]. Where changes have been brought about, it has tended to result in a reduction in competition and a reduction in the number of services offered to the public. European carriers as a group are the ones that have most improved their market share because, in many instances, the actual carriers under the codesharing agreements are the European airlines.

1. Furthermore, it should be noted that competition, in terms of the number of operators or number of flights, could increase where alternative connecting services are able to attract, through competitive tariffs or other inducements, some of the traffic generated between gateway city-pairs.

Table 2-1. Effects of codesharing on traffic development
Europe-United States routes (see explanatory notes which follow)

Codesharing agreement between airlines	*Route*	*Situation "without codesharing"*	*Situation "with codesharing"*			
		Context of traffic development[1, 2]	*Positive change in traffic trend*[3]	*Change in competition*[1]	*Frequency of services offered*[1]	*Airline benefiting from change in market share*[1]
1. Aeroflot/Delta	MOW-NYC	+	no	=	=	US
2. Alitalia/Continental	ROM-NYC	–	no	=	=	=
	MIL-NYC	–	(B)	=	=	=
	ROM-HOU	(A)	(B)	=	+	EUR
3. Alitalia/USAir	ROM/BOS	–	yes	–	–	EUR
4. Austrian/Delta	VIE-NYC	–	yes	–	–	EUR
	VIE-WAS	(A)	(B)	=	+	EUR
5. British/USAir	LON-BWI	+	yes	=	=	EUR
	LON-BOS	+	no	=	+	EUR
	LON-CLT	=	yes	=	=	=
	LON-LAX	=	no	=	=	EUR
	LON-NYC	+	yes	=	=	=
	LON-PHL	+	yes	–	–	EUR
	LON-PIT	=	yes	=	=	=
6. SAS/Continental	CPH-NYC	–	no	–	–	EUR
	OSL-NYC	–	no	–	–	EUR
	STO-NYC	–	no	–	–	EUR
7. Malev/Delta	BUD-NYC	+	yes	–	–	EUR
8. Sabena/Delta	BRU-ATL	–	yes	=	=	US
	BRU-BOS	–	(B)	=	=	=
	BRU-CHI	=	(B)	=	=	=
	BRU-NYC	–	no	–	–	EUR
9. Swissair/Delta	ZRH-ATL	+	no	=	=	=
	ZRH-CVG	(A)	yes	=	+	=
	ZRH-NYC	–	no	–	–	EUR
	GVA-WAS	(A)	(B)	–	–	EUR
10. TAP/Delta	LIS-NYC	=	no	=	=	US
11. KLM/Northwest	AMS-ATL	+	no	=	–	=
	AMS-BOS	+	yes	=	=	=
	AMS-CHI	=	no	=	=	=
	AMS-DTT	–	yes	=	+	=
	AMS-HOU	+	no	=	=	=
	AMS-LAX	+	no	=	=	=
	AMS-MSP	–	yes	=	+	US
	AMS-NYC	+	no	–	–	EUR
	AMS-ORL	+	yes	=	=	=
	AMS-SFO	+	yes	=	=	=
	AMS-WAS	+	yes	=	=	=
12. Lufthansa/United	FRA-ATL	+	no	=	=	=
	FRA-CHI	+	no	=	=	=
	FRA-SFO	+	no	=	=	=
	FRA-WAS	+	yes	=	=	=

1. Decreasing: –; Increasing: +; No Change: =; European airline: EUR; US airline: US.
2. Service non-existent before agreement: (A).
3. Agreement concluded too recently to allow sufficient perspective: (B).

Notes on reading Table 2-1

Table 2-1 summarizes the main findings of the analysis carried out for 12 transatlantic codesharing agreements concluded between American and European airlines and in effect as of 31 December 1994.

For each route covered by the agreement, the following information is given:

- the third column (the situation "without codesharing") gives an indication of the global context of traffic development on the route prior to the codesharing agreement and, especially in recent years, in the event of any irregular trend. The "+" sign denotes a growing trend, the "–" sign a decreasing trend, and the "=" sign a standstill.

- the fourth column (the situation "with codesharing") shows whether codesharing has produced a positive effect on traffic development, i.e. a growth superior to the normal trend described in the previous column or a reverse trend in the case of declining traffic. It is of course impossible to distinguish without further in-depth study whether this eventual traffic increase results from traffic diverted from other routes, or from traffic newly generated because of added convenience, new schedule or other reasons. In some cases and notably when agreements, although concluded in 1994, have been implemented late in the year or in 1995 only, it is too early to make any assessment.

- the fifth column (the situation "with codesharing") shows whether the effect of the codesharing agreement on competition has been an increase (+), a decrease (–) or no change (=), measured in terms of the number of operators, as compared to the situation "without codesharing".

- the sixth column lists the same type of information as the fifth column but for the supply of services in terms of frequencies offered.

- the last column indicates which group of airlines (if any) has benefited most (in terms of change in market share) from the implementation of the codesharing agreements.

- decoding for three-letter airport codes used in the table:

AMS	Amsterdam	LON	London
ATL	Atlanta	MIL	Milan
BOS	Boston	MOW	Moscow
BRU	Bruxelles	MSP	Minneapolis/St. Paul
BUD	Budapest	NYC	New York
BWI	Baltimore/Washington	ORL	Orlando
CHI	Chicago	OSL	Oslo
CLT	Charlotte	PHL	Philadelphia
CPH	Copenhagen	PIT	Pittsburgh
CVG	Cincinnati	ROM	Rome
DTT	Detroit	SFO	San Francisco
FRA	Frankfurt	STO	Stockholm
GVA	Geneva	VIE	Vienna
HOU	Houston	WAS	Washington
LAX	Los Angeles	ZRH	Zurich
LIS	Lisbon		

Chapter 3
ECONOMIC ASPECTS

3.1 The economic aspects of codesharing for airlines, airports and the travelling public are examined from the perspective of international codeshare operations. Several studies have recently attempted to quantify the economic benefits derived from the implementation of codesharing services in a number of airline alliances. This is a difficult exercise and the validity of the results provided has been challenged. The difficulty comes from the recentness of these experiences, the scarcity (or unavailability) of relevant statistical information[1], the problem of separating codesharing from other elements of an alliance, and the possible partiality with which results are presented (airlines engaged in codesharing agreements may have a tendency to overestimate as well as to overrate the results obtained, and partners in an alliance may have diverging views as regards results achieved).

ECONOMIC ASPECTS FOR AIR CARRIERS

3.2 The theoretical benefits of codesharing for airlines are well known: traffic synergy, the resulting revenue increase, and cost savings from joint purchases and economies of scale. For example, based on published figures for average yields, it has been calculated that a percentage point increase of the transatlantic passenger load factor could provide an extra $24 million[2] for a major carrier. In the early days of codesharing, however, obtaining hard evidence of benefits derived from the practice was a difficult exercise and many of the results publicized seemed to be motivated by other than a realistic assessment of actual situations. Now that codesharing agreements have been around for a longer period of time, thereby providing more data, figures are beginning to be produced, not only by the carriers themselves, but also by investigating teams who have verified data from some of the studies already conducted. It remains, nevertheless, extremely difficult to isolate the effects of codesharing from the many elements which normally constitute an airline partnership. Furthermore, benefits other than those attributable to codesharing may flow from other elements in an alliance.

3.3 As far as airlines are concerned, the general findings, highlighted by two United States studies (see Figures 3-1 and 3-2), are that:

- codesharing alliances are beneficial in terms of increased traffic and hence revenues for the partners; and
- these benefits come mostly at the expense of other carriers (those in the same markets which do not have similar types of alliances). In other words, there is ample evidence of traffic distribution or diversion, but not of traffic stimulation.

1. It has to be noted that no internationally agreed statistical reporting rules exist at present for codesharing traffic, with the possible result that this type of traffic could be reported and counted for each airline carrying traffic on a segment. Note, however, the recommendation for better traffic reporting in the United States General Accounting Office (GAO) study referred to in Figure 3-2.
2. All financial figures are expressed in U.S. currency.

A study by an American consultant, Gellman Research Associates, Inc., was commissioned by the United States DOT and released in late 1994.

Among the main findings were the following:

Alliances and competition. Economies of scope occur because it is less expensive to expand an airline's route network than for a new airline to serve the additional route . . . Economies of density occur when it is less expensive to increase service on the existing network than it would be for some other carrier to provide additional service on the same routes . . . Economies of scope and density in international airline service make codesharing most valuable when it is overlaid on the existing hub-and-spoke network of the carriers . . . While international airline markets are more restricted than the U.S. domestic airline market was after deregulation, the additional inter-network competition produced by codesharing should serve to make these markets more open . . . U.S. carriers, because they have already restructured their operations to compete with one another, are well positioned to compete in international airline markets . . .

Measuring the impact of codesharing. An econometric consumer choice model was developed in order to obtain quantitative estimates of the impacts of codesharing, notably on the cost and profitability of airlines and also to quantify benefits to consumers . . . Gains for carriers have been estimated at $7.7 million on an annualized basis . . . Similarly, benefits to consumers derived from the two major codesharing agreements in force at the time of the study, i.e. between KLM and Northwest and between USAir and British Airways, have been estimated at $37.4 million on an annualized basis . . .

Figure 3-1. The GRA report on international codesharing

The General Accounting Office, an investigatory body of the United States Congress, released in April 1995 a study entitled *"International Aviation: Airline Alliances Produce Benefits, but Effect on Competition is Uncertain".*

Among the main findings were the following:

. . . The report found that insufficient data exist to accurately determine what effects alliances actually have on fare structures in the short term, and if they will reduce or increase competition in the long term . . . The United States DOT must therefore issue new rules aimed at more accurately evaluating the competitive effects of strategic codesharing alliances on the United States' airline industry . . . Strategic alliances are considered by the GAO to have greatly benefited participating carriers and to have reduced traffic and revenues for other airlines . . . Benefits to consumers have been brought about through better connections and more efficient on-line services . . . Ample evidence of traffic redistribution was found but no evidence of traffic stimulation . . .

Figure 3-2. Summary of the General Accounting Office study on airline alliances

3.4 In the case of the comprehensive **KLM/Northwest** alliance, of which codesharing is only one aspect, generally considered as the most successful so far, the partners have claimed that for the 1994 financial year (the last available financial year (FY) at the time of writing), revenues have been boosted by $100 million for the European carrier, and by $150 million for the American carrier. The potential to generate even higher gains is considered important. Even if these gains do not come only from the routes covered by the codesharing agreement but also from an increase in interline traffic between the two partners, these figures have to be compared, in the case of Northwest for which such data are available, to operating revenues of $534 million[3] and to an operating profit of $62 million[4] on its transatlantic routes in 1994. KLM's passenger load factor on United States routes has been boosted by 5 percentage points since 1993. Traffic between the Kingdom of the Netherlands and the United States grew by a 13.6 per cent yearly average between 1990 and 1995, while the whole Europe/United States traffic was only progressing by 3.5 per cent per year. The Amsterdam gateway is now being used to funnel flights to and from beyond destinations, at the expense of other European gateways.

3.5 In the case of the **British Airways/USAir** partnership, BA claimed to have received an additional $100 million revenue in the FY 1994/1995 (of which $45 million came directly from codesharing and the rest from other elements of the alliance). Figures for USAir vary, depending on the source, from $20 million to $100 million (of which $29 million in the latter case would come from codesharing itself, another $29 million from the joint frequent flyer programme and $42 million from cost saving). In comparison with these figures, USAir operating revenues on its transatlantic services were $127 million in 1994 (the first full year of codesharing), with an operating loss of $15.4 million, compared with a gain of $19.3 million, on revenues of $218 million in the previous year. In terms of traffic, USAir contributed 12 per cent of British Airways passengers connecting in the United States in the FY 1992/1993, whereas this proportion reached 42 per cent in the FY 1994/1995. In two years, connecting traffic has grown 31 per cent compared with an 18 per cent growth for BA's total United Kingdom/United States traffic. It should be noted, however, that at an early stage BA expressed concern that the partnership between 36 American cities and the United Kingdom was producing additional traffic of only 60 passengers per day[5]. If the total traffic trend on the United Kingdom/United States market is examined for the past ten years, it can be seen that this traffic flow (accounting for a fairly constant 36 per cent of the total Europe/United States market over the period) has only on rare occasions experienced growth rates higher than the average for the total market (see Appendix 2). In conclusion, the partnership has had a significant economic impact through traffic feed for British Airways, but without having any traffic-generating impact on the United States/United Kingdom over-all market.

3.6 The **Lufthansa/United Airlines** alliance is more recent and only limited traffic data were available at the time of writing. At the time of implementing the agreement in mid-1994, the German carrier was reported to be counting on an annual $55 million boost on pre-tax profits from the alliance. Some months later, the carrier claimed an additional 1 000 passengers a day and a 10-point increase in the passenger load factor to/from the United States, to reach 78 per cent. No figures were available from the United States partner, despite claims of increased bookings, though it is possible much of the increase was traffic diverted from other carriers serving Germany directly. However, the LH/UA agreement had little impact on the country-pair market in 1994, and over-all Germany/United States traffic actually declined by 0.7 per cent. Diversion of traffic through Amsterdam is likely to be partly responsible for this situation. More recent figures released by Lufthansa for 1995 indicate that codesharing contributed $67 million to the airline's earnings. This result was achieved through an additional traffic feed of 1 300 passengers per day on 400 daily codesharing flights linking 87 destinations. The German airline, formerly limited to 12 points in the United States, can now serve 41 points through its agreement with United Airlines. As a consequence, traffic figures for the country-pair market improved by 9.7 per cent in 1995.

3. 13.6 per cent over those of 1993.
4. A threefold increase over 1993.
5. At the end of 1994, however, additional traffic averaged 185 passengers per day.

3.7 Information on other partnerships is very limited and, thus far, is concerned with expectations rather than realizations. For example, the **Lufthansa/SAS** alliance is expected by the German partner to have a large impact on revenues and by the Scandinavian partner to improve by 5 per cent the revenue-to-cost ratio over the next 5 years. In the **Austrian Airlines/Delta Airlines** alliance, the profitability of the Vienna-New York route improved, although remaining at a loss, and the load factor reached a high 80 per cent. **British Midland Airways** claimed that its codesharing agreements with 9 airlines in Europe, North America and Asia produce an additional 100 000 passengers per year. As an example, as much as 30 per cent of its passengers on the Glasgow-London route came from partner carriers in 1995. In the case of the sole British Midland/United accord, 2 000 passengers were recorded per month, compared with only 150 in the traditional interline agreement that the two airlines had previously. In its agreements with **Delta Airlines** and **Japan Airlines**, the Brazilian carrier **VARIG** expected to gain annual revenues of $44 million and $21 million, respectively. The agreement between **American Airlines** and **South African Airways** is reported to have resulted in additional annual $2 million revenues for each partner, while the one between **United Airlines** and **Ansett Airlines** (of Australia) produced an extra revenue of $14 million for the United States partner. The agreement between **Delta Airlines** and **Virgin Atlantic Airways** has brought an additional $100 million in its first year of existence, with an extra 700 passengers per day. In the previously mentioned study, the United States General Accounting Office indicated it had received complaints that some carriers had lost revenue in 1994 because of competing alliances: for example, **Continental Airlines** had lost $1 million on its transatlantic routes to Northwest/KLM, **Delta Airlines** had lost $25 million to British Airways/USAir, and an unnamed carrier also claimed to have lost $40 million because of the codesharing practice of competing carriers. It remains to be seen whether these anticipated results eventuate, whether the positive gains from alliances can be sustained in the longer term and whether the responses by competing airlines to these alliances are able to ameliorate any redistribution of revenues to the alliance partners.

3.8 In this connection, it should be noted that some European countries which have no or only limited codesharing services with American cities have experienced growth rates higher than the total market average or even higher than European countries which do have codeshared services. For example, the United States-France market recorded a 8.0 per cent average annual growth rate between 1985 and 1995, compared to a 5.8 per cent overall market average. Only the United States-Kingdom of the Netherlands market, with 10.3 per cent, experienced a higher growth rate. During the 1990-1995 period, Italy also recorded a higher growth rate than the average (see Appendix 2 for further comments and graphs).

3.9 One broad potential negative impact of codesharing should also be mentioned. The fact that more and more long-haul international services of a country may, in the long term, be performed by foreign carriers (because of financial considerations) and not by airlines of that country may lead to loss of jobs and revenue as well as heavy reliance by such countries on foreign carriers, something which could be damaging to the interests of both those countries and their airlines.

ECONOMIC ASPECTS FOR AIRPORTS

3.10 To date very little information is available on the effects of codesharing on airport economics. A relevant question to ask is: Does codesharing bring extra traffic and, hence, extra revenue to the airport in question? The answer may prove to be negative if in fact codesharing is simply the combination of existing services or the replacement of two services by one. The answer, however, might be positive if, because of their convenience and appeal, codeshared services are particularly successful in terms of passenger numbers. Clearly Amsterdam airport traffic has increased notably because of the extensive alliance, including codesharing, between KLM and Northwest Airlines. In the European context, the passenger traffic at this airport has been growing by an average 8.8 per cent

per annum between 1990 and 1995[6], while its main competitors, whether they had codeshared services or not, experienced growth rates between 0 and 5 per cent only. The same outcome is valid for Minneapolis/St. Paul or Detroit airports, at least for their international traffic. It is noteworthy, however, that airports without codeshared services often compare favourably with airports that do have them (see Appendix 2).

3.11 If the answer to the first question (does codesharing bring extra traffic) is yes for a specific case, a supplementary question might be: What extra burden does it impose on that airport's operation? The main consequence will be one of signposting (as mentioned in Chapter 1); this will have varying degrees of complexity according to whether the airport is located at the beginning, the middle (transfer point) or the end of a codeshared service, and it may well involve part or all of these situations.

3.12 When connections between partner carriers can be made through the use of the same wing of a terminal, it helps reduce terminal congestion, thus benefiting airport management, although passengers would, as a result, spend less time in the concessions.

3.13 One other economic factor affecting airports[7] involves the consequences of the volatility of traffic increases which may be attributable to codesharing[8]. Codesharing alliances are rarely immutable; they are susceptible not only to change but also to termination, sometimes with short notice. As a result, traffic re-distribution may be fragile or provisional, since it does not correspond to real[9] traffic flow changes between origin and destination but only to volumes of passengers or freight artificially diverted by marketing techniques. Airports would therefore need to be cautious about relying on extra revenue derived from this practice to establish their budgets or investment plans for the long or even the mid-term. Diverted traffic cannot necessarily be considered as a permanent change or as a firm basis for planning.

3.14 Codesharing may have a special impact on regional airports. This may be a negative one if more and more services are concentrated at key hub airports of the dominating alliance partners, ignoring regional airports and leaving them with feeder services only. It may be positive, however, when services are jointly operated by carriers that would have withdrawn from some routes (or not operated them because of weak demand) but can afford to remain present in the market by sharing the risk with another carrier.

ECONOMIC ASPECTS FOR PASSENGERS

3.15 Apart from the consumer aspects which are dealt with in Chapter 8, the economic consequences of codeshared services for passengers are found mainly in the quality of service and pricing. Any added convenience or improved quality of service that may arise from a codeshare will be difficult to quantify in economic terms. Attempts to do so by giving, for example, a relatively high value to time savings may not be convincing if applied to all passengers carried when, in fact, the vast majority of them travel for leisure or personal motivation. Furthermore, it remains to be demonstrated in each case whether codeshared services are better in terms of

6. An average of +11.2 per cent per year has been recorded during the same period for North American traffic at Amsterdam airport, as against an average of +4.6 per cent p.a. during the 1985-1990 period (and +7.2 per cent p.a. for total traffic). See Appendix 2 for further details and comments.
7. And airlines as well.
8. It is the same kind of phenomenon as the one that occurs with the "hubbing" technique, and inasmuch as the two of them can be used in conjunction, their impact on airport traffic may be felt even more.
9. In the sense where they would normally be justified by economic, tourism or ethnic ties.

convenience and quality of service than traditional interline services, let alone direct non-stop services, with which they are competing. Additional stops, the inconvenience of having to change aircraft, extended routings, excessive circuity and, thus, longer total travel time can be found in some of the codeshared services offered to the public in competition with other more traditional services (also see Appendix 4).

3.16 Theoretically, partners offering codeshared services should take advantage of their combined strength and the cost savings derived from this type of operation to offer tariffs lower than the competition. This has not always proven to be the case, however, and it is difficult to predict how the situation will evolve in the long term, particularly if in some markets competitors have been forced out.

CONCLUSION

3.17 Caution needs to be exercised in regard to the economic effects of codesharing since only partial figures have been published thus far and only for the most prominent arrangements, and a robust deterministic statistical analysis has not been carried out. In some cases, airlines party to a broad accord have clearly benefited from the practice, although largely at the expense of other carriers, since there is no clear evidence of traffic stimulation but rather of traffic redistribution. In some other cases, there may be occasions when, within the context of an alliance, the codesharing arrangement may have the effect of benefiting primarily other carriers and other countries, since services are exclusively operated by the other party, with, as a consequence, a possible loss of jobs and revenue. Moreover, it remains to be seen how the situation will evolve in the long run if, on a given sector, all former competitors either have disappeared or are part of an alliance, and the market has tended to concentrate.

3.18 For airports and passengers alike, codesharing *per se* will not be beneficial in every situation; when circumstances are favourable, however, it could be of value to airport operators and the travelling public. A reservation to this must be made because at present it is unknown how the competitive situation between air carriers will evolve in the long run.

Chapter 4

INTERESTS OF DEVELOPING COUNTRIES

4.1 Airline codesharing may have advantages for developing countries in so far as it can offer the possibility of serving very thin routes, potentially those beyond established gateways, at minimal cost and using heretofore unused traffic rights. It can thus be an instrument to facilitate the participation of developing countries' airlines in international air transport.

NATURE OF PARTICIPATION

4.2 Participation in international air transport can be either direct, where airlines of the developing countries operate international air services by themselves, or indirect, where airlines of the developing countries conclude agreements with airlines of other countries to purchase block space or to jointly operate services that the former cannot economically operate on their own.

4.3 Although codesharing has spread rapidly in just a few years, it is notable that there have so far been relatively very few examples of codesharing ventures involving the airlines of developing countries. While the reasons for this apparent initial disinterest may vary, the fact is that some countries prefer to look towards other forms of co-operation to achieve their objective of participation in international air transport; e.g. multinational airlines, in some instances (for example in Africa), or designation of foreign airlines within the context of economic groupings, in some others. Furthermore, traditional forms of airline commercial co-operation, such as pooling, still exist among airlines of many developing countries.

POTENTIAL BENEFITS AND DRAWBACKS

4.4 The benefits that developing countries' airlines may derive from practising codesharing are not different from those of airlines in developed countries, although in some respects the benefits to the former may have the added economic importance of:

- being present in markets without the burden of the full associated costs, i.e. bringing down the over-all cost of operating international air services;
- obtaining feeder traffic;
- better utilizing capacity, which is particularly valuable on thin routes;
- ensuring exercise or extension of traffic rights;
- remaining competitive by, for example, taking advantage of the partner's stronger position; and
- obtaining better placement on CRS screens.

4.5 For example, an African airline located in the Sahelian zone could codeshare with a European airline not serving that area on points beyond the European gateway served by the African airline, thus gaining access to a greater number of domestic or international European points; it could also codeshare from the same European gateway with another carrier serving, for example, northern transatlantic destinations. Conversely, the same African airline might be an interesting partner for a European, or an American, or an Asian airline to serve points more economically in the central and southern sub-regions of Africa. Point-to-point codesharing services are also another possibility for links between gateways where the demand is not high. In all cases, however, underlying traffic rights for the contemplated new destinations would need to be secured, if they are not already in the portfolio of traffic rights of the country of registration of the would-be codesharing airline.

4.6 Apart from the general consumer aspects that are dealt with in Chapter 8, the main drawback in codesharing for developing countries' airlines comes from the competition aspect. In thin traffic markets, codesharing allows partners to adjust capacity to demand more closely but, in doing so, may eliminate competition between them in respect of fares or on-board amenities. A monopolistic environment may result which could be compounded in circumstances where there is no assurance that other routings might provide the necessary competition.

GOVERNMENT INVOLVEMENT

4.7 Given the special nature of air transport for developing countries, the World-wide Air Transport Conference in 1994 emphasized their need to participate in international air transport and contemplated preferential measures to support such participation. In this context, it may be worthwhile for developed countries to consider granting an exemption from antitrust and competition laws, where relevant and on a case-by-case basis, to the developing countries' airlines that codeshare, particularly when the interests of the travelling public are not impaired and there is no abuse of dominant position by these airlines.

CONCLUSION

4.8 Codesharing has yet to take hold in a substantive way among developing countries' airlines, although this may change as the potential benefits of this form of co-operation come to be viewed as a means of adapting to the changing competitive environment and of enabling developing countries' airlines to participate more economically and effectively in international air transport.

Chapter 5

TRAFFIC RIGHTS/MARKET ACCESS ASPECTS

5.1 Commercial alliances, including codesharing agreements, have been steadily increasing in recent years. One of the underlying motivations for this activity has been airlines' attempts to increase their market access and exposure. Codesharing has emerged as a means of indirectly using market access and has therefore been at the centre of considerable regulatory attention in recent times. This has prompted the need to understand its role and its treatment in the modern aeropolitical context.

UNDERLYING ROUTE AUTHORITY

5.2 Early in its usage, codesharing in international markets was only considered as a transposition of codesharing in domestic markets and as a mere marketing instrument, a kind of extension or enhancement of interlining. Hence, at that time, only the actual operator of the aircraft needed regulatory approval, and neither carrier involved required additional approval for the codeshare.

5.3 In the mid-1980s, however, a concern that codesharing would enable foreign carriers to market services as their own in the large United States domestic market without any equivalent benefits led the United States authorities to require that a foreign carrier wanting to codeshare with a United States carrier must have the underlying authority to do so; i.e. the points to be served within the United States had to be specified and granted in the relevant bilateral air services agreement.

5.4 Some other countries adopted and followed this approach, in some instances extending it so that both codesharing partners were required to have the underlying traffic rights for all the sectors involved, even blind sectors where a carrier was not carrying any local traffic. An alternative approach is to require only the actual operating carrier to have the necessary underlying traffic rights, especially on "gateway-to-gateway" routes[1].

SPECIAL CODESHARING RIGHTS

5.5 Since 1988[2] when the United States Department of Transportation (DOT) noted the absence of "automatic authorization for codesharing operations" in the "Bermuda II" air services agreement with the United Kingdom, it has required specific authorization for all codesharing operations as in the case of the wet lease of an aircraft or a blocked space arrangement, in addition to underlying traffic rights. A "public interest" test is now applied, involving an assessment of the impact of the proposed codeshared service on competition, on the over-all balance of bilateral benefits and on the possibility of using the authorization as a regulatory negotiating lever. It is important to note, however, that the DOT decision did not turn codesharing into a quasi-traffic right. It simply stated that in the absence of a bilateral provision on codesharing, the government is free to regulate and approve such agreements as it wishes. Subsequently, this approach prompted some countries to secure codesharing rights by incorporating a specific codesharing provision in their bilateral air services agreements with the United States and other countries.

1. See the study on codesharing conducted by Deutsche Forschunganstalt für Luft- und Raumfahrt e.V. (DLR).
2. Date of the examination of the proposed codesharing agreement between United Airlines and British Airways.

5.6 The next step in the regulatory evolution of codesharing was to specify traffic rights for the sole purpose of codesharing. Since 1989, codeshare provisions have been included in several new bilateral air services agreements between the United States and some European and Asia-Pacific countries, but these were essentially based on principles of comity and reciprocity. Between 1991 and 1993, specific codeshare rights for the carriers of both sides were included in three renegotiated or new agreements between the United States and major traffic-generating European countries[3]. Each exchange, however, was the outcome of specific negotiations and did not represent a systematic pattern of treatment. In fact, no major government has openly declared under which circumstances codesharing may or may not be used. In the case of the United States, in its pursuit of a more liberal aviation regime, codesharing has now become an element to be examined on a case-by-case basis within the framework of bilateral relationships.

5.7 As a consequence of the ad hoc approaches by authorities, significant differences are found as to how codesharing rights are granted. For example, in the case of the United States/Kingdom of the Netherlands "open skies" agreement, the KLM/Northwest codesharing and broader commercial agreement granted antitrust immunity to the two airlines which enables them to operate as one and without restrictions, whereas the agreements signed between the United States and Germany[4] and Austria, respectively, apply quotas of codesharing flights both to and beyond the concerned countries and, thus, require constant monitoring by authorities to prevent circumvention of the agreed arrangements, as well as prompt continuing requests by interested parties for additional frequencies.

5.8 Some countries require that, apart from underlying rights, the award of codesharing authority should meet certain criteria such as:

- the codeshared service should be in a developmental market; and
- the routing must follow a reasonably straight line and not involve excessive circuity.

The notion of excessive circuity, when designed to limit the number of potential codeshared services, may require greater precision, which could include a time limit on qualifying connecting time.

INVOLVEMENT OF A THIRD COUNTRY

5.9 A complicating factor in international codesharing is the involvement of a third country. Outside regional blocks in which intra-regional traffic is liberalized (and depending on the various air services agreements involved), it might be necessary for the codesharing partners to obtain approval from three separate governments (or even more in the case of multi-stop flights). Faced with the value now attributed to codesharing, the unclear treatment adopted in many instances and the fear that an unbridled spread of the practice risked undermining bilateral limitations on capacity control[5], some countries have begun treating it as a specific traffic right and demanding bilateral

3. Germany, Kingdom of the Netherlands, United Kingdom.
4. This was the situation before the signing of an "open skies" agreement was considered by Germany and the United States in early 1996.
5. The most publicized dispute in that respect involved Germany and the United States over the introduction of codeshared services by Northwest Airlines as part of its agreement with the Dutch carrier KLM. The German position was that the two countries were free to act as they saw fit within the constraints of the relevant bilateral air services agreements. Accordingly, it objected to the codesharing for two main reasons: first, KLM did not have specific authorization for the carriage of traffic on the codeshared services between Germany and the Kingdom of the Netherlands, and second, the codeshared services would exceed the frequency limitations of the United States-German bilateral agreement. KLM's position was that it did not need specific authorization for a mere marketing device; and Northwest's was that connecting flights should not be counted against the third-country codeshare frequency allotment. The dispute was finally settled when the United States government formally appointed Northwest to operate codeshared services to Germany under the United States-German Interim Agreement.

concessions in exchange for the granting of codesharing rights. This happened, for instance, when some countries in Europe, the Middle East and the Indian subcontinent sought benefits in exchange for the granting of codesharing rights to United States carriers.

5.10 However, some analysts believe that the "quasi-traffic right" approach is not correct and that it risks undermining the whole functioning of the air transport system. For instance, a request that frequency limitations be applied on codeshare services and to all potential connecting services could well compromise other existing interline practices and frequency regimes.

GOVERNMENT ROLE

5.11 Since codesharing is a relatively new phenomenon, it is not surprising that few bilateral air services agreements have specific provisions which refer to it. This has not prevented governments from intervening, however, even if at times forced by the negotiating imperatives to do so.

5.12 Although designed originally as a simple marketing tool, codesharing has come to be considered by governments, as a result of market circumstances affecting their carriers, as an instrument of negotiation and has been used as such. Where the granting by one leading traffic-generating country of codesharing authority now depends in large part on the nature of the relevant aeronautical relationship, other countries have been prompted to consider including specific codesharing provisions in their bilateral agreements. Such response, however, may be more directed to protecting short-term interests rather than to applying a longer-term regulatory strategy.

5.13 As suggested by some analysts, the codesharing issue might prove to be an area particularly suited to a multilateral agreement, after it has been demonstrated that it really benefits all parties concerned. For instance, to put it in its simplest form, country A might not be very interested in an agreement with country B but might see major gains from an agreement with country C, which in turn would want to codeshare with country B. The challenge would be to ensure that the codesharing which presently exists in a narrow bilateral context for the purpose of increasing market access would not in fact be an impediment to any development of a liberalized multilateral framework. Furthermore, any such multilateral agreement should contain no constraint of any form imposed on the codesharing practice, except for safety matters, consumer information and protection, and possibly competition aspects.

CONCLUSION

5.14 Other than its link to traffic rights, codesharing does not have a systematic regulatory treatment, but rather an ad hoc treatment dictated by general aeropolitical considerations. However, it has been a reactive — in some respects, protective — treatment which is applied to it, instead of being based on a more strategically planned vision of future aeronautical relationships. It should be borne in mind that, paradoxically, a reliance on codesharing as a means to greater market access, while increasing competition in some circumstances, can in other circumstances actually impede the development of a truly liberalized air transport regulatory framework and, in particular, any multilateral approach to liberalization.

Chapter 6
COMPETITION ASPECTS

6.1 Codesharing raises the issue of competition in two ways: either as an enhancement of competition by the provision of additional or better service or as a reduction of it by a concentration of the forces at work in the market. One view is that, in general, codesharing tends to strengthen the position of codesharing partners and so reduce competition between them. The proponents of codesharing, however, will usually point to the potential cost and other efficiencies gained, the improvements in quality, if not quantity, of service offered in the market and the possibility for using rights that may be otherwise unutilized. When competition aspects are concerned, it is relevant to assess codesharing agreements according to the characteristics of the markets served. In markets where there are few competitors to begin with, a further reduction in the number in that market may threaten competition; on the other hand, in markets where there are a large number of carriers, codesharing agreements might have the effect of leading to more effective competition between airlines. In any event, in most cases, the competition implications of codesharing in isolation are likely to be overshadowed by those implications associated with the wider airline partnership of which codesharing is normally just a part.

POSSIBLE ANTI-COMPETITIVE EFFECTS

6.2 In the view of competition or antitrust law enforcement authorities, codesharing agreements are forms of corporate integration that lie somewhere between outright mergers and traditional interlining agreements; they thus can raise horizontal as well as vertical competitive concerns.

6.3 As with mergers and other forms of intercorporate agreements, codesharing arrangements may have anti-competitive impact because of their potential to:

- eliminate existing or future competition between the participating carriers;
- permit actual or potential competitors to allocate markets;
- limit capacity, under an agreement between partners; and
- raise fares, by common agreement between partners.

6.4 Such situations could easily occur on point-to-point services and concerns will increase if the markets are already concentrated, for example, as a result of regulatory limitations on the number of carriers that may enter these markets, a situation rather common in country-pair traffic. Codesharing creates combinations between former and potential competitors. One purpose of these combinations is to increase the average unit revenues of the codesharing partners by reducing or eliminating price and product competition, thus depriving consumers of the benefits of competition.

6.5 As time passes and the marketing strength of the codesharing combinations increases, competition may be even further reduced as nonaligned independent carriers, unable to offer as many origin-destination combinations as their codesharing competitors, withdraw from related markets.

6.6 Applying this reasoning to the transatlantic market, if all major transatlantic airlines were linked into transatlantic partnerships, and even more if they were granted antitrust immunity, a danger exists, albeit hypothetically, that those without partners may either withdraw from the market, seek protection from their governments through more restrictive bilateral agreements, or complain about the major carriers' partnerships resulting in abuse of dominant position. This point was underlined by a 1995 United States General Accounting Office evaluation of the advantages and disadvantages of strategic alliances which found that each agreement favours the partners over other partnerships and non-partnerships. In short, a proliferation of alliances in the transatlantic market could potentially lead to greater market concentration where a small number of major airlines have a dominant effect on the over-all price level and the number and the quality of services.

6.7 A related aspect is the opportunity for all carriers to enter into codesharing agreements, if they so wish. Some smaller airlines may not benefit from such an opportunity either because their markets are of no interest to the major airlines or because in the international community of airlines they do not attract partners due to quality of service or management. One possible solution which has been suggested to overcome this problem would be to use a "most favoured airline" clause, whereby any airline could apply to codeshare with another on the same terms that similarly placed airlines have already negotiated. Another suggestion would be to have the less favoured airlines establish consortia with sufficient market reach and attraction to make them interesting codesharing partners.

INCREASE OF COMPETITION IN SOME MARKETS

6.8 As with mergers and other forms of agreements between carriers, codesharing arrangements have the potential to be significantly pro-competitive, as long as they create new services, improve existing services, lower costs and increase efficiency for the benefit of the travelling public.

6.9 Codesharing arrangements have a pro-competitive potential in so far as they allow carriers to enter or develop routes that would otherwise not be viable to operate[1], thus creating new service opportunities for the travelling public. In a given market, codesharing is often considered as having the potential to enhance services between city-pairs if computer reservation systems are used. In the Germany-United States market, for instance, there seem to be more possibilities to go from a point in the United States to a point in Germany, through different codesharing partnerships involving various American and European airlines, than existed before these partnerships took place, when the only services offered to the public were those of the authorized American and German airlines. It has to be noted that even if these new opportunities are in fact only a way of marketing interlining services that already existed, they nevertheless involve a greater number of beyond gateway points and might be more convenient to use, although they imply a change of aircraft somewhere.

6.10 Any claims of pro-competitive potential, however, will need to be carefully examined by regulatory authorities so as to ascertain that they will in fact benefit the public by providing convenient alternatives (in terms of travel time, number of connections, connecting time, circuity, through tariff, etc.) to existing direct or even interline services.

6.11 In some cases, codesharing might also increase competition indirectly. An example is to be found in the United Kingdom where British Midland Airways, as a result of a number of codesharing agreements concluded with different airlines, some of them long-haul, offers alternatives to the routes operated by the main British operator, British Airways.

1. This was the justification offered both by Northwest/KLM for their Amsterdam-Detroit and Minneapolis/St. Paul services and by Delta/Swissair for their Cincinnati-Zurich service.

GOVERNMENT INVOLVEMENT

6.12 As previously indicated, in the United States, the Department of Transportation will approve codesharing arrangements only if they pass the "public interest" test, that is, if the benefits of the arrangement outweigh the possible loss of competition. The competitive aspect, however, is not the only element to be examined in that test. International comity and foreign policy considerations, such as reciprocity and the balance of benefits in the bilateral aviation relationship with the foreign country concerned, may also be considered. In the well-known case of the broad marketing arrangement, including codesharing, signed between Northwest and KLM, the United States DOT considered that the arrangement would result in a possible loss of competition in two city-pair markets due to competitive overlap. It nevertheless granted antitrust immunity to the agreement because it would "benefit the public with better service, more efficient Northwest/KLM operations, and cost savings" and because "a denial of antitrust immunity would contravene the spirit of the Open Skies Accord and be counterproductive to the United States' relations with the Netherlands". In that case the United States authorities considered that the granting of immunity would promote competition by furthering its efforts to obtain less restrictive aviation agreements with other European countries.

6.13 With the current development of codesharing agreements and alliances, there is an increased pressure on United States authorities to grant antitrust immunity on a wider basis to other partnerships. When immunity has not been granted, United States antitrust laws prohibit further integration of the airlines' operations. Delta Airlines and Swissair, for example, have been allowed to codeshare only on the basis of assurances that they maintain separate marketing, sales, pricing, and risk of profit or loss for each of the routes covered by the agreement. Both airlines are explicitly obliged to compete with each other over the codeshared routes.

6.14 In the European Union (EU), the European Commission does not examine codeshare cases *per se* but rather their impact on competition, a matter coming within EU jurisdiction under the Treaty of Rome[2]. The objective of the relevant competition provisions of the Treaty (Article 85 and 86) is the avoidance of abuse of dominant position. The same is valid for situations in which codesharing between EU carriers would evolve into the type of pool arrangements which the EU proscribed in the earlier years of liberalization. Another aspect that is closely monitored by European authorities as far as competition is concerned is the issue of the display of codeshared services in computer reservation systems (see also Chapters 1 and 8, and Appendix 4).

CONCLUSION

6.15 As noted in some of the studies already conducted on codesharing, the effects of codesharing on competition are still uncertain, especially in the long term, because of the lack of sufficient perspective. Nevertheless, one conclusion from experience thus far may be that the potential relative pro- and anti-competitive aspects of a proposed codesharing arrangement need to be weighed carefully in each particular case. Furthermore, as codesharing arrangements spread, there is likely to be an increased resort to competition laws by aeronautical authorities in order to provide criteria for such assessments, particularly in light of the significant marketing impact of codesharing. Notwithstanding this competition law aspect, the broader aeropolitical and regulatory objectives often associated with codesharing can be expected to continue as pre-eminent considerations.

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2. Nevertheless, in 1995, the European Commission initiated a study on four aspects of the codesharing practice, namely, competition issues, CRS display, consumer aspects and the effect on regional airports.

Chapter 7
LEGAL ASPECTS

7.1 This chapter deals with problems linked to the fact that codesharing may give rise to uncertainties concerning carrier liability. Technically, codesharing covers a variety of situations. For purposes of this discussion, two are distinguished: where it involves a connection, it amounts to successive carriage by different carriers; where it does not involve a connection, such as in the case of a point-to-point joint service, it nevertheless involves two different carriers. In both cases, these carriers may be subject to different liability régimes. Should an accident on a codeshared flight occur, with possible passenger death or injury or baggage loss or damage, the question is to know which liability régime would apply, whether it would be that of the operating carrier or that of the contracting carrier (the carrier issuing the ticket), when the contracting carrier is not the operating carrier. Similar concern may be expressed about which carrier is responsible for passengers who miss connections or are denied boarding through overbooking, change of aircraft size, etc.

CARRIER LIABILITY UNDER THE WARSAW SYSTEM

7.2 In the case of two or more successive carriers, Articles 30.1 and 30.2 of the Warsaw Convention, the basic legal framework of air carrier liability, provide for assumption of liability for each carrier (''one of the contracting parties to the contract of transportation in so far as the contract deals with part of the transportation which is performed under its supervision''). They further state that ''in the case of transportation of this nature, the passenger or his representative can take action only against the carrier who performed the transportation during which the accident or delay occurred, save in the case where, by express agreement, the first carrier has assumed liability for the whole journey''. The question that arises is whether these provisions are applicable to the new operational concept of codesharing or whether it is the text of the Supplementary Convention signed in Guadalajara (1961) which could be applicable to this particular situation. (Guadalajara extends the Warsaw rules to the actual carrier when the contracting carrier does not perform the transport.)

7.3 Some uncertainty may arise from the apparent contradiction of Articles 30.1 and 30.2 and the underlying principles governing codesharing. A typical codesharing agreement may, and generally does, include provisions addressing the issue of indemnity and assumption of liability between the carriers party to the agreement. Moreover, regulatory authorities licensing air carriers to perform codeshared services generally require the carrier applying for authority, and in whose name the passenger ticket will be issued (i.e. the contract of carriage), to be responsible for the passenger as far as liability is concerned. It is very much in the essence of codesharing that the passenger need look to only one carrier for all facets of service, including accident liability.

7.4 A conflict of laws situation may therefore occur when, in the event of an accident of a carrier transporting passengers holding tickets issued by the codeshare partner of the carrier, those passengers, who would normally be required to claim only against the operator (as per the Warsaw Convention) may, if they follow the pertinent aviation regulations of some States, be required to look to the codeshare partner for relief instead. If the operator's liability limit is higher, however, passengers might want to follow Warsaw and claim against the operator. In such a case, the operator could possibly counter such claim by invoking the saving clause of Article 30.2 (''save in the case where, by express agreement, the first carrier has assumed liability for the whole journey'').

7.5 Where the carriage is on a codeshared service that does not involve a connection but is a point-to-point joint service operation, other liability considerations may arise. For example, if both the contracting carrier and the actual carrier are subject to the Guadalajara Convention, then that régime extends the Warsaw rules to the actual carrier when the carriage is not performed by the contracting carrier, but gives the passenger the option as to the carrier from which to seek redress. However, the industry standard Conditions of Contract provides that "an air carrier issuing a ticket for carriage over the lines of another carrier does so only as its agent", which suggests that the liability for death or personal injury, or loss or damage to baggage may only be attributed to the actual carrier. As with successive carrier-type codeshare situations, the absence of case law guidance makes difficult any definitive answers to such issues of carrier liability in these situations.

LIABILITY LIMITS

7.6 Generally speaking, in the event of death, personal injury or loss of baggage on an international flight involving a codeshare, the liability limits should be those applicable to the transportation in question, as defined in the Warsaw Convention; thus:

- if the country of the place of departure and place of destination have both signed the Hague Protocol, the liability limits will be those of the Protocol; and

- if the Montreal Agreement of 1966 applies, the limits will be those of this agreement.

7.7 However, under the laws of some States, if the carrier holding out the service for the transportation in question has unilaterally raised its liability limits, these limits would apply, even though the carrier holding out the service was not the operator of the segment, since it is the carrier holding out the service that has a contract of carriage with the passenger.

7.8 The issue of liability limits is under active consideration both in ICAO and in the airline forum of the International Air Transport Association (IATA) where a new intercarrier agreement similar to the Montreal Agreement of 1966 has been proposed.

USER LIABILITY

7.9 Airline industry rules and practices are that the problems of lost baggage are addressed to the carrier operating the last leg of the journey, and that an airline which operates the flight leg on which a passenger is denied boarding is the one having legal responsibility for compensating codesharing passengers. It is conceivable, however, that the ultimate legal responsibility for assisting connecting codesharing passengers in case of problems of missed connections, lost baggage, denied boarding, etc. may lie with the airline with which the passenger has a contract of carriage, that is, the airline whose code is on the passenger ticket.

CONCLUSION

7.10 Two important legal issues are posed by codesharing: Which air carrier is liable under the Warsaw régime and which air carrier is responsible to the passenger in user/consumer-related matters? In the case of the former, it would appear that codesharing, when it involves a connection, need not necessarily be equated to successive carriage

such as in the usual case with interlining, but that ultimate legal responsibility could nonetheless be determined by the contract of carriage between the passenger and the contracting carrier, depending on the interest of the passenger or its claimants. Where the codeshared service does not involve successive carriage, then other legal considerations concerning the right of liability redress may arise. With respect to responsibility to user-related issues, the usual airline industry rules and practices would apply, i.e. responsibility rests with the operating carrier. In any event, before engaging in providing services, codesharing partners should meet certain requirements, i.e. agree on liability issues and give notice to the public, so that these become part of the terms and conditions of carriage.

Chapter 8
CONSUMER ASPECTS

8.1 The consequences for consumers of codesharing raise two basic but opposing questions: Is it a deceptive practice or, alternatively, is it beneficial to the consumer? Codesharing is deceptive if the passenger believes that a flight is being operated by one airline when in fact it is operated by another one. Thus, passengers may be deceived as to the identity of the airline and aircraft type on which they find themselves flying. Codesharing may also be deceptive if codeshared flights are displayed too many times in computer reservation systems, resulting in "screen padding" which makes it more difficult to identify all the flight options.

8.2 The over-all concern is that information on actual or potential travel given to the travelling public must be accurate and complete and not confusing or in any way misleading. Hence, better information and a measure of consumer protection are advocated.

8.3 Codesharing is beneficial to the public when it increases the number of flight options offered and improves the convenience of travel through seamless connections.

BACKGROUND

8.4 Basically, the argument against airline codesharing is that the consumer (the passenger) is sold one product but in reality receives a different one, a practice which, in the absence of prior notification, would be considered deceptive in any industry.

8.5 Since CRSs are the most important means presently used to market and sell air transport products and given the critical role of the first screen in a neutral display, airlines, in their pursuit of maximizing exposure in the marketplace, have developed many strategic techniques to optimize the best possible position on CRS screens. This has led to widespread use of funnel and "phantom" flights as well as codeshared flights. Rather than creating actual new air links, such flights may occupy space on CRS screens and relegate competitors' services to remote screens.

8.6 In the absence of a CRS regulation to the contrary, codeshared services might be presented several times on CRS screens (see Figure 8-1). This occurs because airlines in an alliance list flight segments under their own code, with the CRS also displaying other possible combinations. This leads to so-called screen padding which can result in travel agents giving preference to codeshared routings that are higher in the listings even when normal interline routings may prove more convenient. In the case of codesharing arrangements involving more than two partners, the number of flight options grows geometrically, with a consequential swamping of CRS screens by codeshared flights (see Figure 1-4 and Appendix 4). Quantitative limits are used in the EU (European Union) and ECAC (European Civil Aviation Conference) CRS codes of conduct for codeshared flights, up to a maximum of two displays. While this should cover the majority of codesharing arrangements, it will not cover those having more than two partners. The new ICAO Code of Conduct on the Regulation and Operation of Computer Reservation Systems permits the same codeshared flight or combination of flights to be displayed up to a maximum of three times.

8.7 As far as passengers are concerned, several difficulties may occur: passengers may discover only when they reach the airport that they are booked on an airline and/or an aircraft they prefer not to use for whatever reason (they

may find that the flight is going to be on a small turboprop aircraft or on an aircraft made by a manufacturer about which they may have concerns or which may, for example, have limitations on the carriage of baggage), rather than on the expected well-known wide-body jet; they may be confused about where to check in and, during connections, where to find the partner airline; or they may have language difficulties if cabin or other airline staff are not fluent in the national language of the carrier whose code is used.

INFORMATION FOR THE TRAVELLING PUBLIC

8.8 The new ICAO Code of Conduct requires that consumers be informed about the operating carrier with respect to the codeshared flights. However, few countries have so far adopted regulations able to cope with the problems presented above. The United States has had rules since 1985 (Code of Federal Regulation 399.88), under which airlines are required to inform passengers about the identity of the carrier on which they will be travelling. Following concerns that this regulation was too narrow, the Department of Transport (DOT) issued a Notice of Proposed Rule Making suggesting several amendments, among which was the requirement that foreign airlines should also be covered by the disclosure rules. The United States DOT also plans to expand reporting requirements for all carriers involved in codesharing arrangements, in order to better monitor developments and enable any necessary regulatory response. In Europe, at present, the only specific rules governing codeshared flights are those contained in the European Union Code of Conduct on CRS regulation, covering the identification of codeshared services and the number of times they can be displayed. Following a revision made to the rules in 1993, codeshared services may be displayed twice. The United States rules on codesharing and CRSs do not restrict CRS displays in this way. After a number of meetings during 1995 with a broad cross-section of interested parties, an ECAC Task Force on codesharing found that they were ready to accept the need for transparency in the interest of consumer protection, but the question of how complete and accurate information can be made available still remains. In addressing this question, the Task Force looked at the different needs that arise at each stage of a journey: information needed before booking a flight, during the journey itself, and afterwards if something has gone wrong during the journey.

1st case: one-leg point-to-point service.
Example: Lufthansa flight LH493 from Vancouver to Frankfurt (also offered by Canadian Airlines under flight number CP*6020).
CRS display: Two lines will be used, one for each service.

2nd case: two-leg connecting service (one-way codesharing).
Example: USAir flight US1952 from Nashville to Philadelphia (also offered by British Airways as BA*7458) connecting with flight BA218 from Philadelphia to London.
CRS display: Two lines will be used, one showing the US + BA combination, the other showing the BA* + BA combination.

3rd case: two-leg connecting service (two-way codesharing).
Example: United Airlines flight UA940 from Chicago to Frankfurt (also offered by Lufthansa as LH*6501) connecting with flight LH588 from Frankfurt to Cairo (also offered by United as UA*3684).
CRS display: Three lines will be used, one showing the UA + UA* combination, another one the UA + LH combination, and another one the LH* + LH combination. [The fourth theoretical combination, i.e. LH* + UA*, is usually not displayed, as it does not make much sense.]

Note.— For three-leg connecting services, see Figure 1-4.

Figure 8-1. Display of codeshared services

8.9 As a general rule, codeshared flights are identified by an asterisk or other typographical symbol in airline schedules, both in the printed form (timetables) and in CRS displays. Sales staff of airlines and travel agents therefore need to be alerted to the existence of a codeshared operation. As far as CRS displays are concerned, additional and more detailed information on the flight can be accessed through secondary displays. The problem that arises, however, is that busy sales staff in travel agencies do not always have the time to make such secondary inquiries, with the result that clients may be sold codeshared flights without appreciating their significance. Presentation of data in a more user-friendly way on CRSs would help improve matters. CRS vendors give training courses and packages with their systems, but high rates of staff turnover in sales offices, coupled with pressure to complete transactions quickly, inevitably mean that consumers are not always provided with full information, particularly at the booking stage.

8.10 The Task Force, however, was of the opinion that the situation could be improved and, to this end, proposed as a first step that joint efforts be made by airlines, travel agents, CRS vendors and other data providers to find ways of better informing the consumer. A step in that direction could be the provision of more detailed information with the itinerary document. A drawback is that this document is usually issued only after a booking has been made. Nevertheless, the provision of such a document as a matter of course[1] would go some way toward making the position clearer for the traveller. Itinerary documents are currently issued in accordance with either a standard format provided by CRSs or a customized format developed by individual travel agents. In any event, it is considered important that the name of the actual operator of each segment of a codeshared flight be identified on the itinerary document.

8.11 The Task Force also investigated the possibilities of including additional information on the airline ticket, a possible requirement that is also being pursued by a country outside Europe. Automated tickets provide the best prospects for including extra information. Their use in some parts of the world (including Europe) is, however, not yet extensive and the vast majority of tickets used continue to be of the traditional booklet form. While industry experts agree that the scope for including extra information on traditional tickets is non-existent, at least one major European airline alerts its passengers to the existence of a codeshared operation by inserting an endorsement on such tickets. In addition, as ticketless travel becomes more prevalent over the coming years, the ticketing opportunities to inform passengers about codeshared services will encounter further difficulties.

8.12 As far as information needs during the journey are concerned, the ECAC Task Force considered that the itinerary document could provide not only the information needed before undertaking the first leg of a journey, but also guidance on the remaining leg(s), and notably at the connection stage. Airports, airlines and their agents can further assist by clearly displaying arrivals and departures on flight information boards and by signposting in check-in areas, gates, etc. Clear information on whom to approach in the case of denied boarding, missed connections, mislaid baggage, etc. is also important.

8.13 It is essential that the passenger with a problem (e.g. lost baggage) after the journey has been completed should be informed as to whom to contact for follow-up action. As regards the question of legal liability under the Warsaw System, codesharing carriers should provide information on passengers' entitlements, including information on the responsible carrier.

1. In a similar way to the one that could be adopted for ticketless travel, where a number of essential notices have to be provided to the passenger, notably on the conditions of contract of carriage, liability limits, status of reservation, fare applied, that is, a document that could also be used as a receipt for accounting purposes, without placing an undue burden on carriers (see DOT's Request for Comments on "Ticketless Travel: Passenger Notices", Docket No. OST-96-993).

CONSUMER PROTECTION

8.14 Given the problems raised and the likely continued spread of codesharing as a marketing and operational tool by airlines, the question for the international aeronautical community is whether the need to remain competitive will prompt airlines to take action to ensure consumers are fully informed concerning codeshared flights or, alternatively, whether any action is needed to protect consumers. For instance, is a code of conduct needed? Airlines and CRS vendors have argued in favour of letting the matter be resolved at industry level. Others, like the consumers' organization FATUREU (Federation of Air Transport User Representatives in the European Union), are of the opinion that the matters in question are too important to be left to self-regulation and believe that regulation of travel agents and other intermediaries would be unenforceable. In their view, full responsibility should be placed on airlines to ensure that information provided on codeshared flights is complete and accurate. An example of a constructive airline initiative, one which addresses more than just consumer protection aspects, was provided by the Code of Conduct proposed and circulated by British Midland Airways (see Figure 8-2). It should be noted that there are advantages to a self-regulated scheme of improvement based on voluntary measures. For this reason, the ECAC Task Force did not wish to recommend the taking of governmental regulatory measures if a satisfactory end result could be achieved through such action. Another factor in this approach was that any rules or recommendations adopted by ECAC are usually not legally enforceable in its member States, unless the latter introduce their own legislation. For such a complex subject, separate but harmonized legislation in over 30 countries is unlikely. A solution would be, as has happened in the past with CRSs or Denied Boarding Compensation, for the EU and EEA (European Economic Area) to adopt the regulation put forward by ECAC and to give it the full force of law within their territories, although this would account for only about half of ECAC's membership.

1. All codeshare arrangements must meet the criteria that they increase the range of **competition** and choice available to the travelling public.
2. Codeshare partners should endeavour to deliver **a level of service** compatible with an on-line connection operation.
3. Timetables, brochures, advertising and promotional material should **identify the involvement of a codeshare partner**.
4. The customer must be informed of the identity of the codeshare flight operator, and of any change in gauge, before **a booking** is made.
5. The identity of the codeshare flight operator must be retained in the **Passenger Name Record**.
6. As an absolute minimum, the identity of the codeshare flight operator must appear on the **ticket**. Ideally, the codeshare partner's flight prefix and number should be replaced by those of the codeshare flight operator.
7. When an **itinerary** is printed, the codeshare flight operator's flight prefix and number are mandatory, whereas the codeshare partner's flight prefix and number may be omitted.
8. When a **boarding card/baggage tag** is printed, the codeshare flight operator's flight prefix and number must replace those of the codeshare partner.
9. Marketing airlines must maintain the ultimate **responsibility** for passenger satisfaction at all times.
10. All carriers' **staff** involved in the delivery of codeshare operation must be fully briefed and trained to support all aspects of the codeshare product.

Note.— Emphasis (bold type) has been added by the ICAO Secretariat for ease of reading.

Figure 8-2. British Midland's proposed code of conduct for the operation of codeshare agreements

8.15 Accordingly, the action adopted at the ECAC level was the formulation (for adoption in 1996) of a proposed recommendation[2] on consumer information/protection needs in connection with codeshared air services that should be implemented by all parties concerned. The approach adopted was, as a first step, to rely on industry to take appropriate measures to improve the situation. Airlines, as codesharing partners, would have the primary responsibility; others involved in the information chain — CRS vendors, other data providers, travel agents and airports — would also have roles to play. In the event that the goodwill of the industry to take appropriate measures would be insufficient, however, the ECAC Task Force in its recommendation introduced a review clause, with the possibility, if needed, of regulatory intervention at a later stage.

IS CODESHARING REALLY BENEFICIAL TO THE PUBLIC?

8.16 In view of all the publicity that has been associated with codesharing, the basic question is whether this practice really provides consumers with a superior service, compared to traditional air services with which it competes (normal interlining, point-to-point service). The question has to be assessed in terms of quality of service, flight options and tariffs. Although in-depth studies on these specific subjects have not systematically been carried out, it is nevertheless possible to draw a certain number of tentative conclusions from experience.

8.17 By its very essence, codesharing implies a connection somewhere during the journey, except when it is used on gateway-to-gateway legs; hence, it is usually at a disadvantage compared to competing non-stop services, in terms of travel time, or even compared to a comparable traditional multi-stop service where, provided there is no en-route change of gauge, the passenger does not have to change aircraft and, in some cases, does not even have to disembark from the aircraft. In terms of convenience, the main elements to be taken into consideration are listed below.

- *Quality of service.* This can also be interpreted as *over-all convenience.* Some of the codeshared services are to be found on routings where no direct links exist, for example, those created by a combination of beyond-gateway and gateway-to-gateway links. On these specific routings, the advantages of codesharing over traditional interlining should be clear; indeed, it is in these conditions that the expression "enhanced interlining" has real meaning. Co-ordinated schedules and ease of transfer by the shared use of terminals between partners are positive features and greatly contribute to the "seamlessness" of the codeshared product. Indeed, the more the codeshared service operates as an on-line service with single check-in, through baggage and seat allocation and using the same section of the terminal for plane change, etc., the more convenient it is than traditional interline. The problem, however, is that it is not always so convenient. There are many examples of extended transit times where codesharing passengers are not better treated than if they were simply interlining in the traditional manner. There are also examples where the transfer between partner airlines does not work smoothly. More often than not, there are notable differences in the level of service provided by the different partner airlines, which after all is normal but too often concealed from the public, for the sake of apparent seamlessness. Depending on airport layout, and this is even more true at major airports, passengers may sometimes be obliged to change terminals with a codesharing service. When carefully examined, routings proposed by some codeshared services[3] may end up being very circuitous (sometimes going backwards), thus creating an over-all elapsed time much longer than non-codeshared services, though this could be offset by such flights offering cheaper fares.

2. See text of draft Recommendation in Appendix 3.
3. This characteristic is also found in on-line hubbing.

- *Number of flight options.* Codeshared services would normally be expected to increase the number of opportunities offered to the public on a given routing or on neighbouring routings (and not represent existing services as new ones by a mere duplication of flight numbers) rather than reduce the over-all number of services. In certain cases, however, the latter will happen, especially on thin routes when the operating airlines agree to exploit the route in co-operation, thereby rationalizing capacity.

- *Tariffs.* Taking advantage of the economies generated by their agreements on the one hand, and of regulatory arrangements like antitrust immunity, when granted, on the other hand, airlines participating in a co-operative scheme such as codesharing should be able to offer lower tariffs to passengers than other airlines, although in markets with tariff flexibility this advantage is less likely to exist. It remains to be seen, however, how this benefit will evolve on a long-term basis, given the uncertainties arising from the potential impact of codesharing on competition.

- *Frequent flyer programmes.* Another potential benefit of codeshared services for the passenger may be the increased likelihood of earning frequent flyer credits since codesharing agreements are more likely to integrate these programmes than traditional interline arrangements.

CONCLUSION

8.18 There is now a general recognition that the information provided to the public on codeshared flights is not sufficient and needs to be improved. If the solution of placing the burden of responsibility at the industry level (i.e. mostly on airlines but also on travel agents and others in the information chain) is to be adopted, information to passengers should be provided in the following three ways:

- orally and, if possible, in writing at the time of booking;

- in written form, i.e. on the ticket itself and/or (if not possible), on the itinerary document accompanying the ticket, or on any other document replacing the ticket, such as a written confirmation, including information on whom to contact if problems arise and a clear indication of which airline is responsible in case of damage or accident; and

- orally again, by the airline's airport ground staff at all stages of the journey.

8.19 Caution is necessary when judging the benefits to the travelling public claimed for the practice of airline codesharing, and the elements of quality of service, flight options and tariffs will be pivotal to any assessment of benefit. The simple fact of a service being codeshared will not automatically result in a better air service than an interline or non-stop one, and each case will need to be judged on its merits.

Chapter 9
LABOUR ASPECTS

9.1 The implications of codesharing on labour are mainly felt in the air transport industry work force and, specifically, at management levels.

IMPACT ON THE AIR TRANSPORT INDUSTRY WORK FORCE

9.2 Major trends affecting the air transport industry in general, such as privatization, cross-border investment, joint ventures, as well as codesharing and other forms of co-operation, are all having an impact on the environment in which airline staff now have to work. Furthermore, depressed financial results in recent years have placed enormous pressure on airlines to lower their unit costs. The combined results of these factors have often translated into significant downsizing of staff numbers, increased pressure and deterioration of working conditions, with potential implications for safety standards (see Chapter 10).

9.3 Codesharing, blocked space agreements and franchising, among other forms of co-operation, raise questions of how to allocate jobs among the carriers concerned. In any kind of co-operation, and even more so when co-operation is of the advanced type, such as one that comes close to a merger, there is an underlying risk for one airline of losing jobs *vis-à-vis* the partner, for example, when the partner's aircraft and crews are used instead of its own.

IMPACT AT AIRLINE MANAGEMENT LEVEL

9.4 Another implication of codesharing on labour relates, at the micro-level, to the necessary changes that are brought about by an alliance, not only in quantitative terms, but also in qualitative terms, such as the way airlines are managed and the new working attitudes that may be expected from staff. Once the aims of an alliance between two (or more) air carriers are clear, the top and middle management of both the partners have to be able to implement them successfully by co-operating effectively. A strong alliance needs to be built on a common business culture and decision-making process, in order to avoid mutual frustration and misunderstanding.

9.5 Beyond the possible redundancies that may need to be implemented, a process generally not conducive to a harmonious labour relationship at the beginning of an alliance, the success of the alliance lies with all airline staff, and especially middle management, who are left with the real challenge of making the theoretical benefits work in practice. This may involve difficult negotiations about the number of aircraft in the fleet jointly operated, its composition, aircraft layout, staff working conditions, joint purchases of insurance, fuel, spares, aircraft, catering, etc., all of which must have a degree of commonality if substantial results are to be obtained. Achieving this may mean letting one of the partners negotiate or decide on behalf of the other, thus implying an advanced level of co-ordination, compromise and trust. Also implied at different levels will be new attitudes *vis-à-vis* consumers and the need to acquire new skills, or improve them, notably in the language field. Working against these efforts are factors such as the reluctance to share confidential information when a carrier may revert to being a competitor should the alliance fail, the concern being that this competitor could be strengthened by this newly acquired in-depth

knowledge of the former partner. It is often claimed that the recipe for a successful alliance, which *inter alia* implies the partner's commitment to modify its working habits and its product in the interest of the alliance, needs two essential components: an equity investment and the full commitment of staff. Both are advocated as necessary glue to cement the alliance although, as experience has shown, an alliance that is underpinned by an equity investment is not a guarantee for a successful long-term partnership.

CONCLUSION

9.6 New trends affecting the air transport industry have put enormous pressure on staff, at various levels and in different respects. Since air transport is labour-intensive, motivated employees clearly have an influence on airline performance. It is the employees who deal directly with the consumers, and their attitudes are of the utmost importance in the relationship between airlines and their passengers. It will therefore be in the interest of all parties concerned that due consideration be given to staff concerns during the process of alliance-making and its implementation.

Chapter 10

SECURITY, FACILITATION, SAFETY AND THE ENVIRONMENT

10.1 Codesharing may have implications for operational aspects of air transport, such as security, facilitation, safety, and the environment.

SECURITY

10.2 Clear lines of accountability and responsibility are essential for the implementation and subsequent monitoring of aviation security measures in respect of flights that are operated under collaborative arrangements such as codesharing. In view of the complexity of arrangements being devised between airlines, relevant authorities may find it difficult to determine their level of involvement *vis-à-vis* other authorities. In these circumstances, the questions of responsibility and accountability for aviation security on the ground can lead to uncertainty.

10.3 Different aviation security arrangements may exist between States of registration of codesharing partners. As a consequence, pressure may be exerted by one State to apply its specific requirements on all flights originating from another State or community of States and operated by the foreign partners of its own carriers. Such requirements for baggage and cargo, while not disputable in substance, may create capacity problems at airports of the other State if for example, screening on 100 per cent of flights is carried out instead of random sampling. The question which this raises, therefore, is who has primary responsibility; the usual practice is that those States from which flights depart and through which they transit are responsible.

10.4 Air carriers have to make clear their respective levels of responsibility and accountability for the application and implementation of the appropriate measures, standards and/or recommended practices in respect of their flights. They also have a vested interest in ensuring that States are clear as to air carriers' responsibilities, particularly in view of the States' liability in the event of an act of unlawful interference.

10.5 A significant factor relevant to the security implications of collaborative arrangements is differing levels of implementation between States of the provisions of Annex 17 to the Convention on International Civil Aviation. Another factor is the potential for the threat and risk level of one State or operator to be transferred to another State or operator. These two elements in themselves confirm that collaborative arrangements may generate important security concerns, all the more since there are currently no provisions in Annex 17 which address these questions.

10.6 In May 1995, ICAO's Aviation Security Panel initiated consideration of the security aspects of codesharing. The Panel recognized the complexity of the issue, as well as other forms of collaborative arrangements between operators, and undertook to further examine the adequacy of Annex 17 provisions and of supporting guidance material.

FACILITATION

10.7 There are no specific provisions for codesharing services in relation to facilitation in Annex 9 to the Convention. The following areas may, however, need further consideration.

10.8 *Responsibility for cargo manifests.* Air carriers are required by the Convention to carry a manifest (paper or electronic) of all cargo on board. National Customs legislation generally requires the carrier to present the manifest to the customs authorities upon arrival of the aircraft (or permits the manifest to be transmitted in advance, if electronic). In addition, the operator of the aircraft is responsible for the accuracy of the manifest and is required to explain quantitative discrepancies. There is also considerable liability for fines related to discovery of unauthorized (allegedly smuggled) narcotics in cargo. When the two carriers involved in the codesharing arrangement board cargo on the same flight, the question raised is who is responsible for the manifest of the cargo boarded by the non-operating carrier. In many cases, changes to customs laws may be needed in order to assign responsibility and liability to the non-operating carrier for the transmission and accuracy of manifests of cargo transported under its name. The concept of the NVOCC (non-vessel operating common carrier — an entity that plays the contractual role of a vessel owner but does not own the vessel) may be applicable.

10.9 *Export licensing of aircraft spare parts, equipment and supplies.* National legislation usually provides for exemption from export licensing of items that a carrier exports on its own aircraft for use in its own installations overseas. If a carrier uses a codeshared flight and thus manifests the items on its "own flight", but the goods are actually transported on the other carrier's aircraft, does the exemption still apply? The answer may necessitate legislative changes.

10.10 *Responsibility for immigration fines and inadmissible passengers.* Immigration legislation generally assigns to the operator of the aircraft liability for fines and penalties if a passenger's travel documents (passport, visa, etc.) are not valid. The operator is also responsible for removing an inadmissible passenger who is refused entry or subsequently deported. In a codesharing arrangement, the carrier that checked in the passenger may be different from the carrier that actually transported the passenger. Since the tickets and reservation record carry the name of only one carrier, it is sometimes difficult to determine which of the two carriers is responsible. The two carriers need an agreement on the assignment of liability in such cases.

SAFETY

10.11 A concern similar to the one mentioned in 10.2 and 10.3 exists as to what degree of supervision of regulatory authorities, from a safety perspective, should be imposed on the operations of foreign carriers' partners in a codesharing arrangement with one of their own licensed carriers. The view of the aeronautical community and usual airline practice are that the responsibility imposed on the State of registry under the Convention as regards safety aspects is no different for codesharing operations than for interline operations.

10.12 In any event, for safety purposes, a clear definition of the respective technical and operational responsibilities for codesharing flights is needed from airlines, in order that crews operating the aircraft have a clear idea of their entitlements and duties and that the travelling public may be reassured of any safety aspects.

10.13 In its draft recommendation on codesharing, the European Civil Aviation Conference has introduced two whereas clauses specifically addressing safety matters, one referring to the ultimate responsibility of the contracting carrier (which may be contrasted with the practice mentioned in 10.11), and the other considering that greater transparency may be required with regard to the delimitation of operational and technical responsibilities for codeshared services.

ENVIRONMENT

10.14 At airports that are involved in this kind of airline activity, codesharing, by rationalizing the number of flights on certain routes, can be expected to contribute to less environmental damage due to aircraft noise and engine emission through a reduced number of aircraft movements.

10.15 It has to be kept in mind, however, that at airports where hub-and-spoke and funnel flights systems are used, the frequencies on the feeder routes tend to be more numerous in order to offer the maximum opportunities to the travelling public and to efficiently feed the major routes, thus improving the load factor of the latter. In cases of feeder codesharing then, codesharing does not bring an ameliorating impact on the environment through a reduction in the over-all number of services. Moreover, in some instances, codesharing, inasmuch as it is the only means of making low traffic routes profitable, may prompt the creation of new routes that would not exist otherwise.

CONCLUSION

10.16 Clear lines of accountability and responsibility are essential for security/facilitation aspects as well as for safety aspects, since technical and operational regulations may vary considerably from one airline partner in a codesharing arrangement to another, depending on their countries of registration. In terms of environment, the codesharing practice may have both positive and negative aspects in so far as it has the potential of creating new aircraft movements or reducing them.

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Appendix 1

ANALYSIS OF THE EFFECTS OF CODESHARING ON TRAFFIC DEVELOPMENT OF A SAMPLE OF ROUTES

Of the 20 codesharing agreements that have been concluded in recent years between Europe and the United States, 12 (for which a sufficient amount of data was available) have been analysed, covering 42 different transatlantic city-pairs. The results of this analysis are shown in Table 2-1.

Given the volume of data handled for the analysis, not all basic tables and graphs for all routes are reproduced in this Appendix and only one sample is provided, covering 11 routes (the KLM/Northwest agreement).

Notes for reading the following tables

Airlines operating

XX means that airline XX operates direct air services on the route considered.

(YY) means that airline YY operates air services with change of aircraft at an intermediate stop (under the same flight number). In fact, this is an online connecting service and traffic carried on such a route is statistically recorded separately for the two legs of the journey but not on a true origin to destination basis. *For example, if airline YY operates a service from AAA to BBB with change of aircraft in CCC, there will be traffic statistics for the AAA-CCC and CCC-BBB routes but not for the AAA-BBB route.*

WW/ZZ
1. Two airline codes separated by a / indicate a codeshared service.
2. In the codeshared service between airlines WW and ZZ, the underlining indicates the actual carrier operating the service.

Airline and airport codes

Decoding for codes used in the tables is provided for each case examined.

Codesharing agreement between KLM and Northwest Airlines concluded in 1989 and approved by the United States DOT in 1991
(Case #11 analysed and presented in Table 2-1)

Routes concerned

Amsterdam (AMS)-Atlanta (ATL)
Amsterdam-Boston (BOS)
Amsterdam-Chicago (CHI)
Amsterdam-Detroit (DTT)
Amsterdam-Houston (HOU)
Amsterdam-Los Angeles (LAX)
Amsterdam-Minneapolis/St. Paul (MSP)
Amsterdam-New York (NYC)
Amsterdam-Orlando (ORL)
Amsterdam-San Francisco (SFO)
Amsterdam-Washington (WAS)

Carriers concerned

Continental (CO)
Delta (DL)
KLM (KL)
Martinair (MP)
Northwest Airlines (NW)
Pan Am (PA)
Tower Air (FF)
TWA (TW)
United Airlines (UA)

Airlines operating

	AMS-ATL	AMS-BOS	AMS-CHI	AMS-DTT	AMS-HOU	AMS-LAX
1990	DL KL	NW	KL	(PA)	KL(CO)	KL(CO)(DL)(NW)
1991	DL KL	NW	KL	(nil)	KL(CO)	KL(TW)(DL)(NW)
1992	DL KL	NW	KL(UA)	KL/NW	KL(CO)	KL(TW)(DL)(NW)
1993	DL KL	KL/NW	KL	KL/NW	KL(CO)	KL(TW)(DL)
1994	DL KL/NW	KL/NW	KL/NW	KL/NW	KL/NW(CO)	KL/NW MP(UA)
1995	DL KL/NW	KL/NW	KL/NW	KL/NW	KL/NW(CO)	KL/NW MP(UA)

	AMS-MSP	AMS-NYC	AMS-ORL	AMS-SFO	AMS-WAS
1990	(nil)	KL TW(PA)(CO)	DL KL	(CO)(DL)	(nil)
1991	KL/NW	KL TW(PA)(CO)	KL(UA)(DL)	(DL)	(UA)
1992	KL/NW	KL TW UA DL(CO)	KL(DL)	(DL)	(nil)
1993	KL/NW	KL TW DL(CO)	KL(DL)	KL(DL)(UA)	KL UA(NW)
1994	KL/NW	KL/NW DL MP FF(CO)	KL/NW MP	KL/NW(DL)(UA)(NW)	KL/NW UA(NW)
1995	KL/NW KL/NW	KL/NW DL MP FF(CO)	MP(DL)	KL/NW(DL)	KL/NW UA

Source: OAG and ABC

The following figures show the history of traffic development (on an on-flight origin and destination basis) and airline market shares.

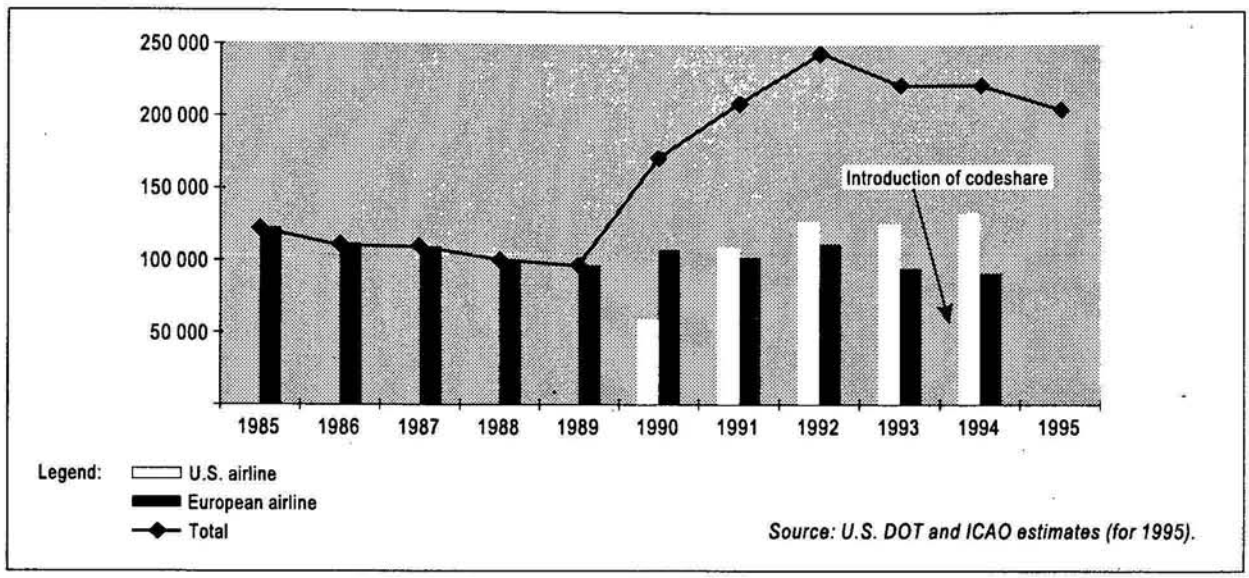

Figure A1-1. Case #11 — Passenger traffic trend on the Amsterdam-Atlanta route

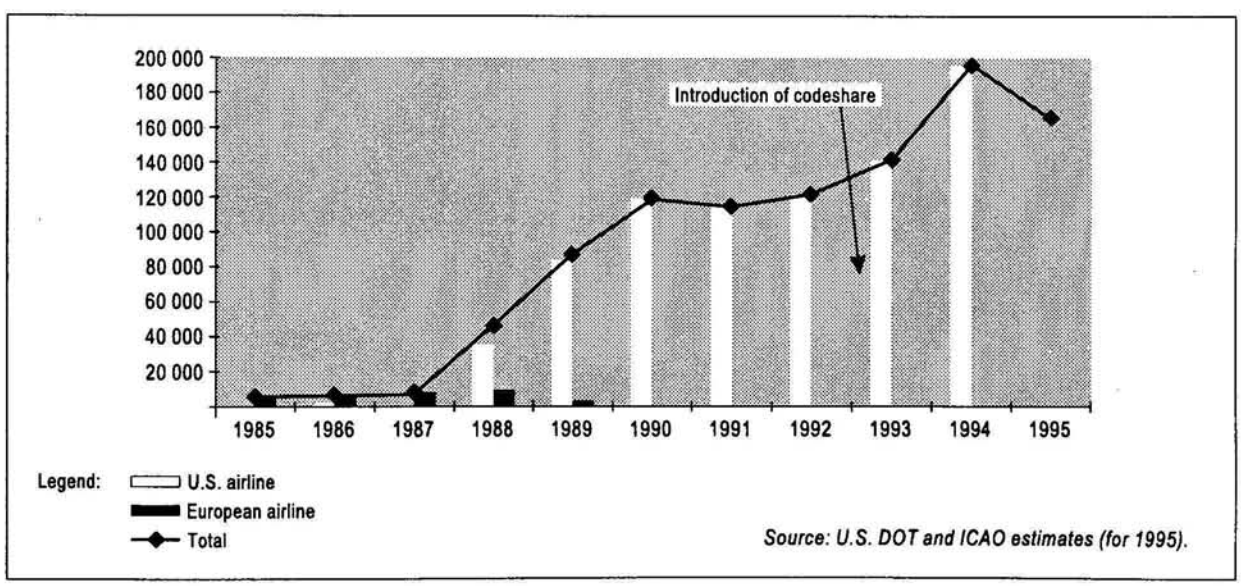

Figure A1-2. Case #11 — Passenger traffic trend on the Amsterdam-Boston route

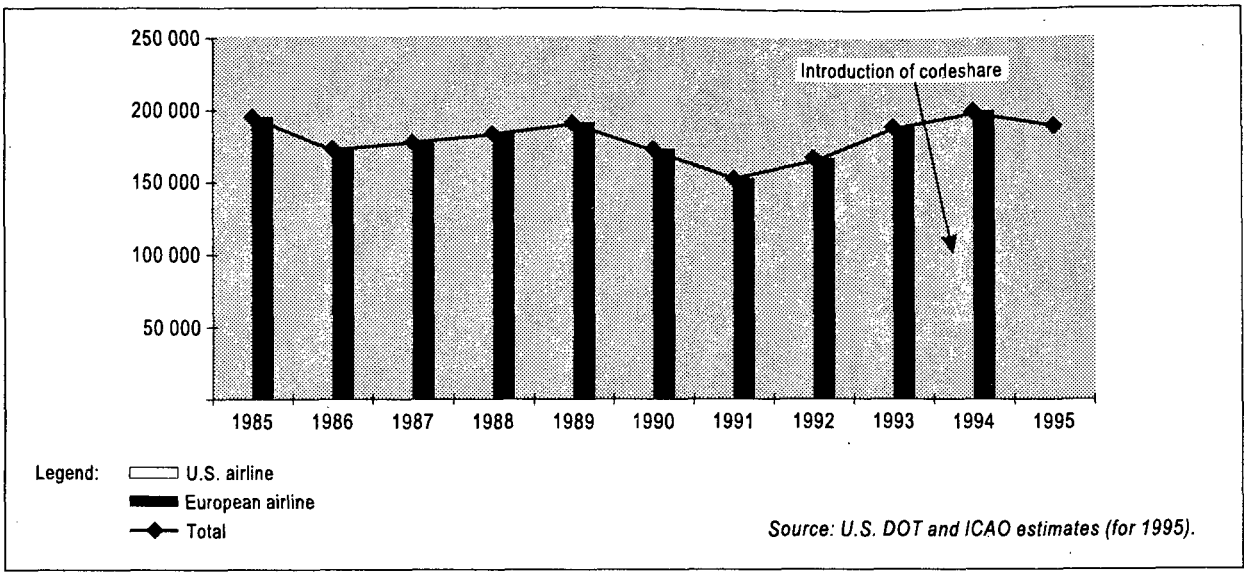

Figure A1-3. Case #11 — Passenger traffic trend on the Amsterdam-Chicago route

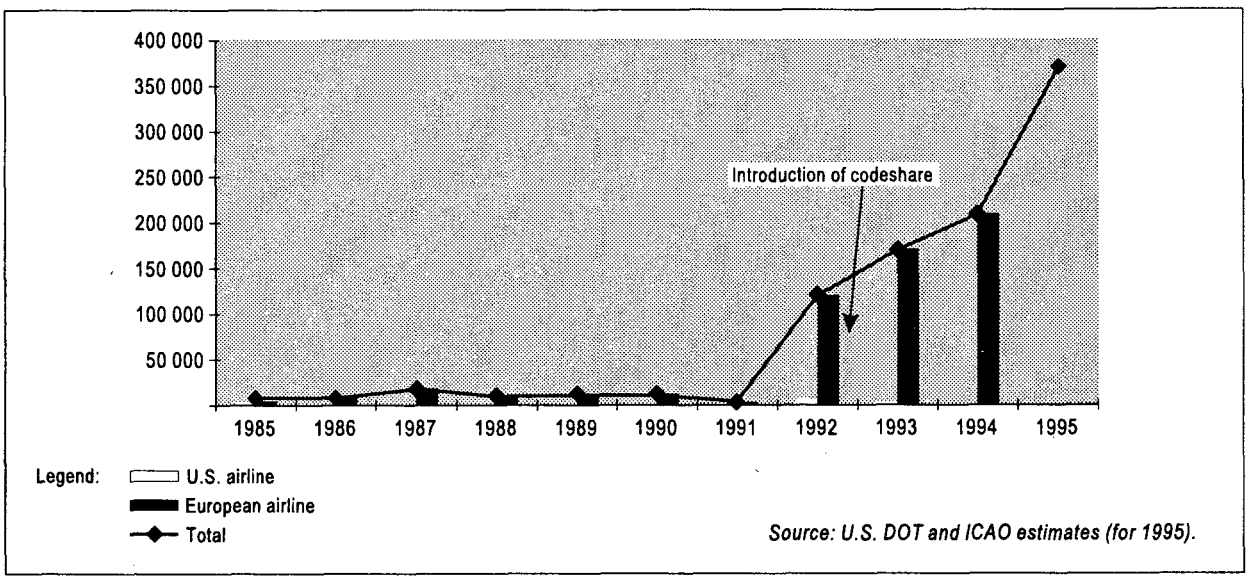

Figure A1-4. Case #11 — Passenger traffic trend on the Amsterdam-Detroit route

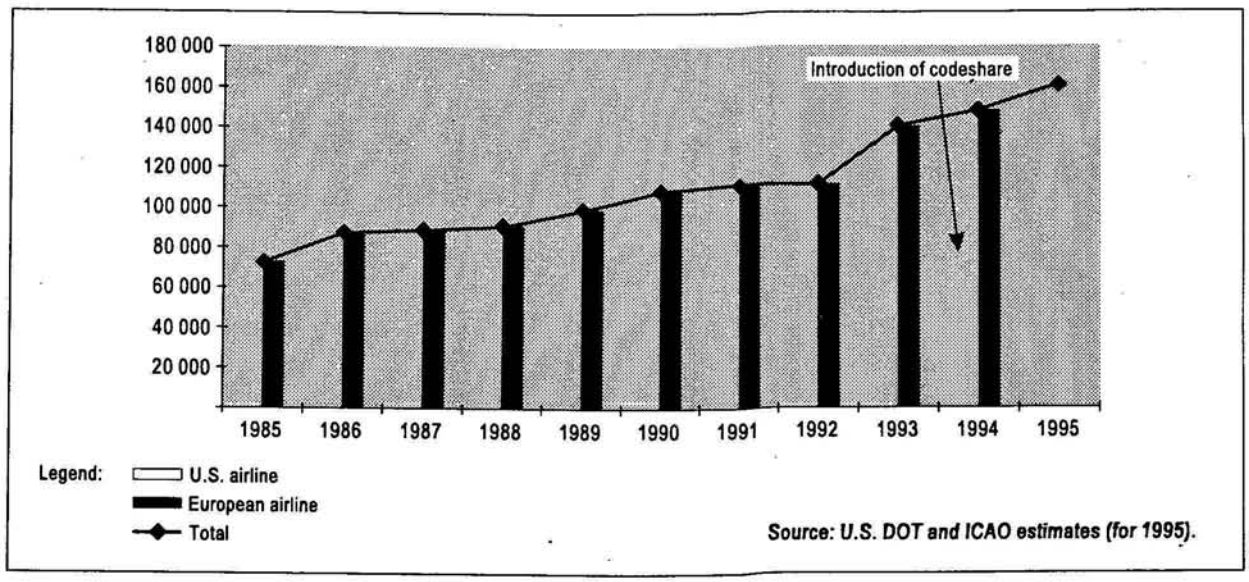

Figure A1-5. Case #11 — Passenger traffic trend on the Amsterdam-Houston route

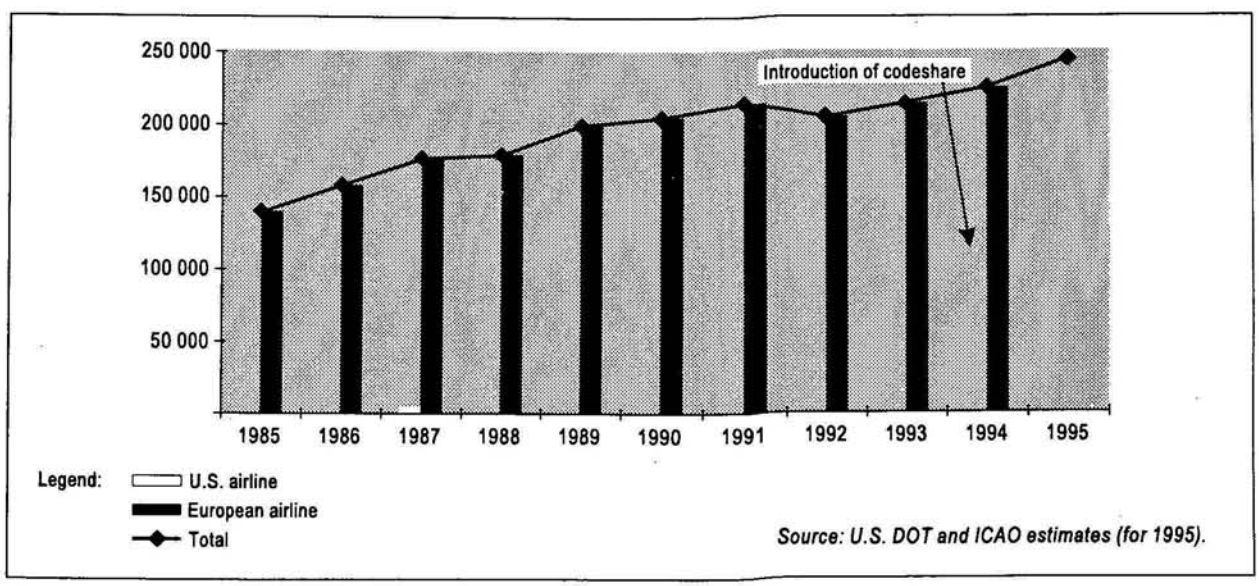

Figure A1-6. Case #11 — Passenger traffic trend on the Amsterdam-Los Angeles route

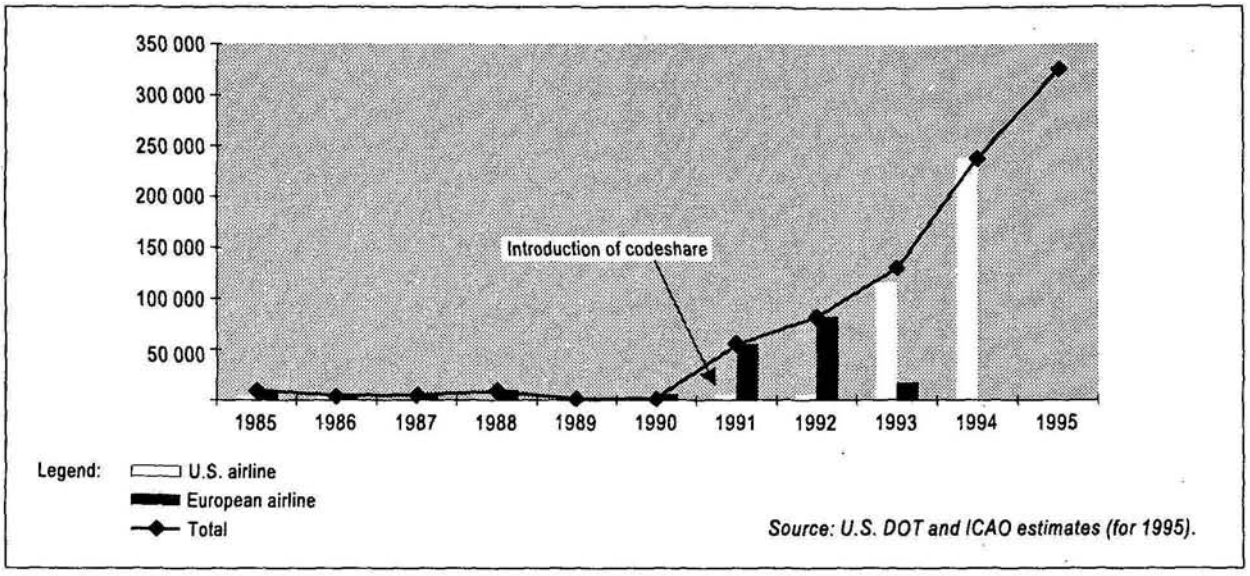

Figure A1-7. Case #11 — Passenger traffic trend on the Amsterdam-Minneapolis/St. Paul route

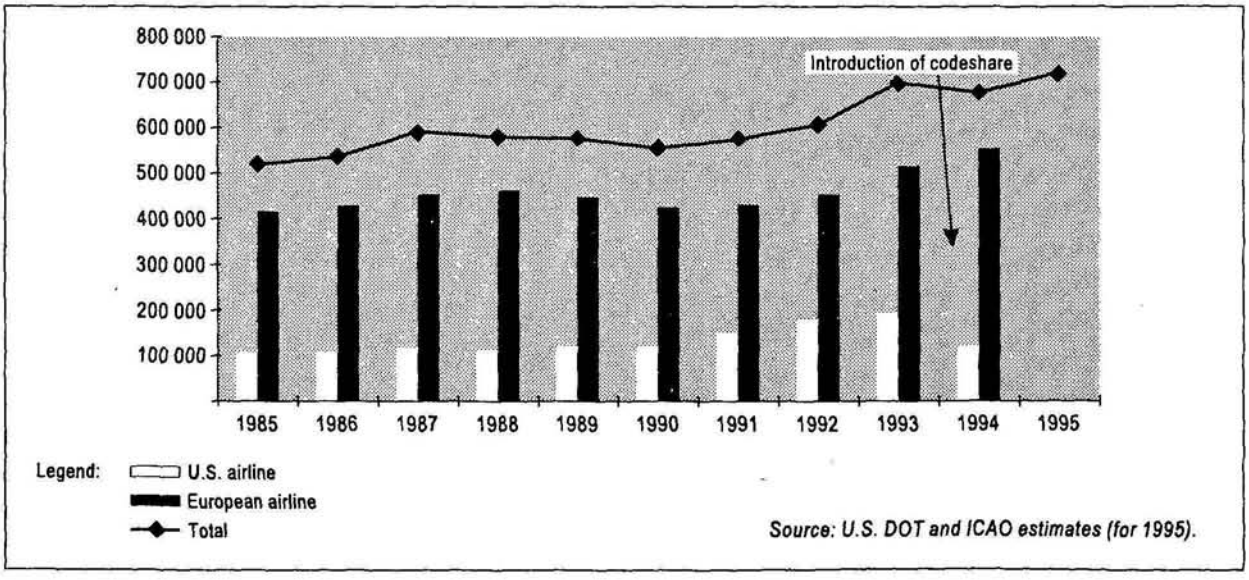

Figure A1-8. Case #11 — Passenger traffic trend on the Amsterdam-New York route

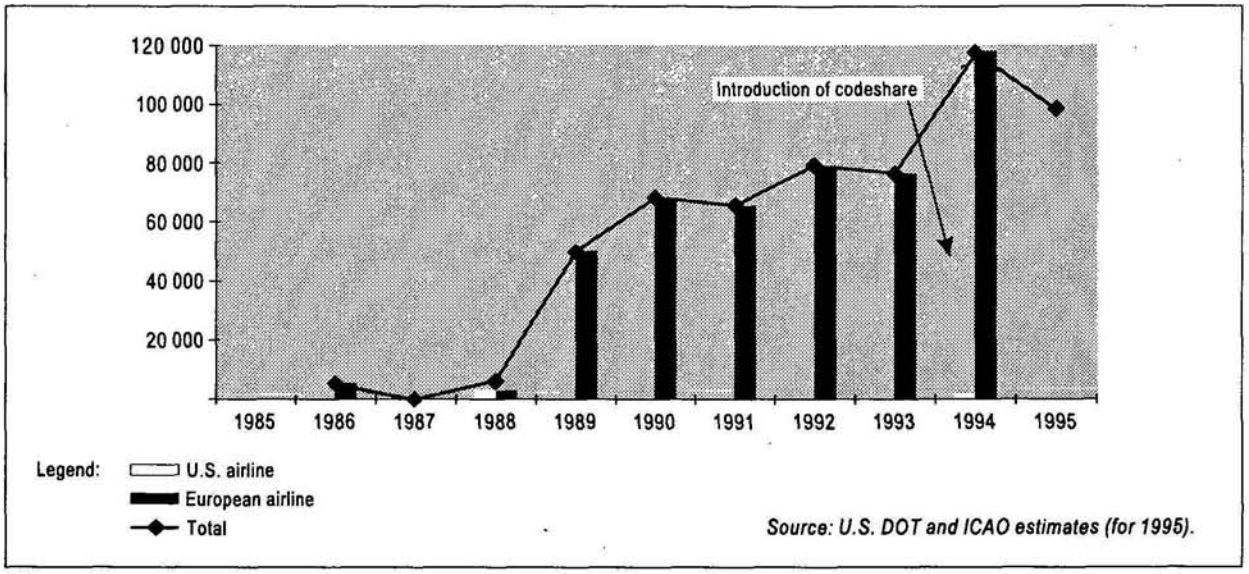

Figure A1-9. Case #11 — Passenger traffic trend on the Amsterdam-Orlando route

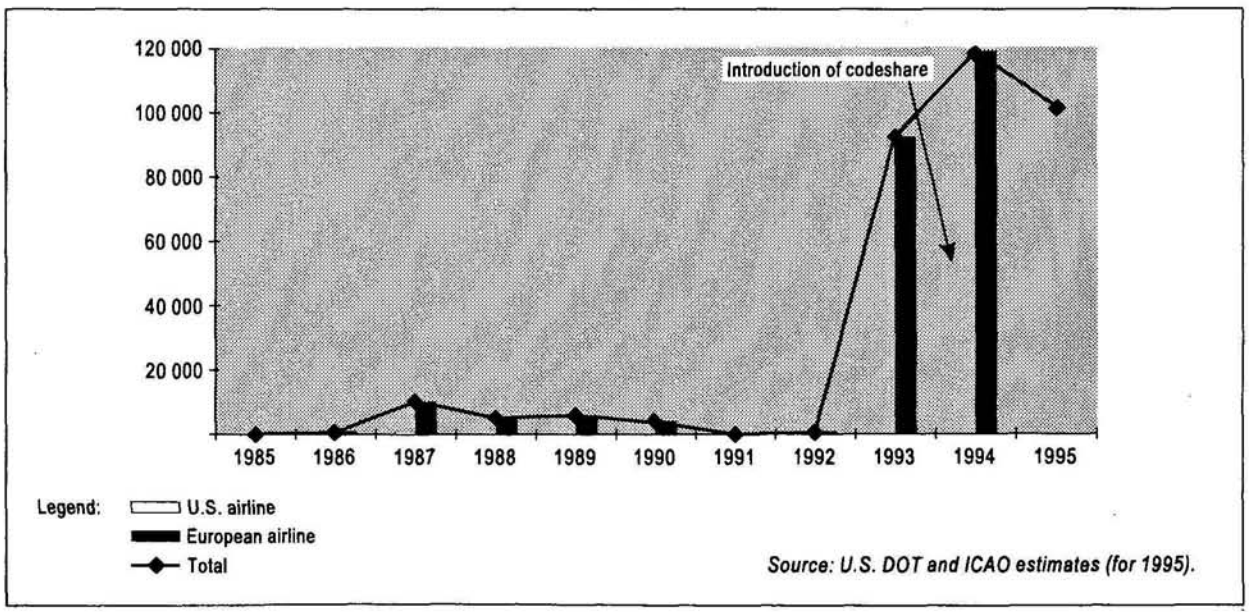

Figure A1-10. Case #11 — Passenger traffic trend on the Amsterdam-San Francisco route

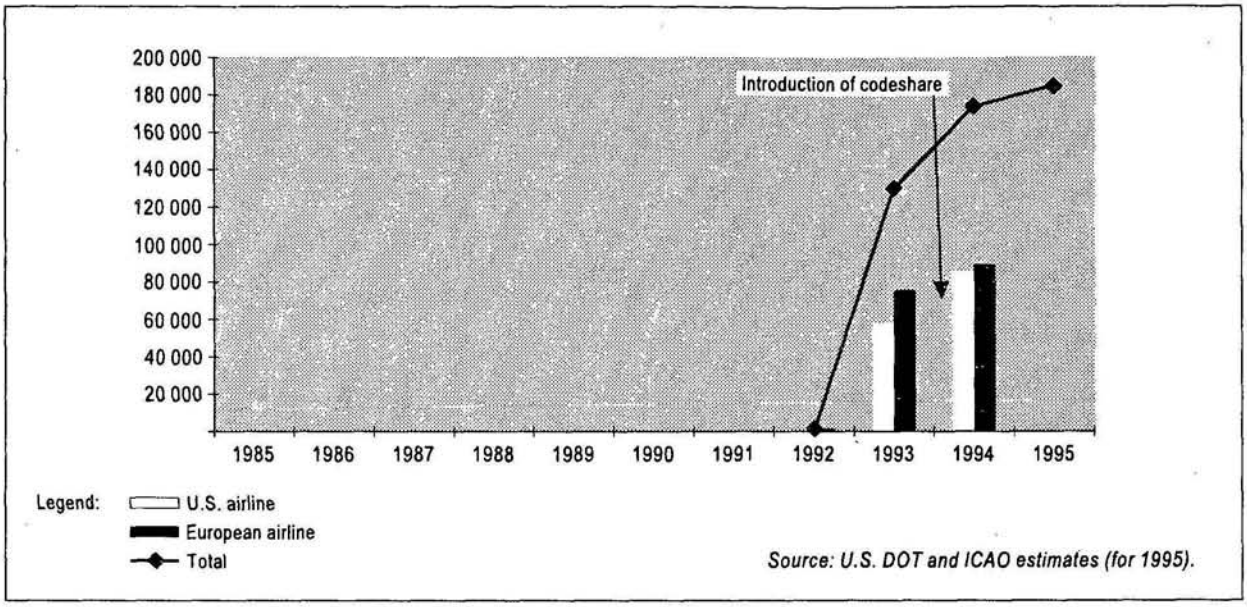

Figure A1-11. Case #11 — Passenger traffic trend on the Amsterdam-Washington route

Comments/conclusion

Atlanta route: Codesharing introduced in 1994, but ATL gateway is not used for beyond gateway inland connecting services. No change in competition (from DL). Frequencies slightly reduced. Traffic slightly decreasing. Share of United States airlines improving but codeshared operation actually performed by KL could modify the picture. Codeshared service possibly introduced to reverse the declining trend, but to no avail so far.

Boston route: Codesharing introduced in 1993. BOS is moderately used for beyond gateway inland connecting services (14 points only). Frequency has remained the same. There is no competition. Traffic has been growing steadily since 1993, but a 15 per cent setback was recorded in 1995.

Chicago route: Codesharing introduced in 1994, but CHI is not used for beyond gateway inland connecting services. No change in frequencies provided. Market free from competition. Although already at a high level, traffic seems to be levelling off. Codesharing does not seem to have given new impetus.

Detroit route: Codesharing introduced in 1992. DTT is the gateway the most heavily used for inland connections in the KL/NW agreement (to/from 80 points). Traffic has grown very quickly since 1992 and, as a result, frequency doubled in 1995. No competition on the route. Since there was very little local traffic between the two cities prior to the codesharing agreement, traffic on this route clearly appears to be thoroughly generated by inland connections *(this is a case of artificially routed traffic; "artificially" in the sense that there is no strong basic traffic between the two cities and operating airlines might very well decide to re-route this connecting traffic through another gateway if circumstances proved more favourable elsewhere, or for any other reason).*

Houston route: Codesharing introduced in 1994. HOU gateway not used for beyond gateway inland connecting services. No real direct competition on this route (a United States airline provides only change-of-gauge services, but these are not taken into account in traffic statistics as evidenced by the market share of United States airlines which is nil). No change in frequency of flights offered to the public. Historical growth of traffic has been regular so far, and nothing worth noting happened in 1994 with the introduction of codeshared services. Perhaps too early to draw significant conclusions.

Los Angeles route: Codesharing services introduced in 1994. LAX gateway is used for connecting traffic to Honolulu only. Although quite a number of airlines appear in the schedule guides, on this route there is no real direct competition apart from a limited one coming from the KLM subsidiary Martinair. Frequency on direct services has remained unchanged over the last 6 years. Traffic development has shown very moderate growth over the last 6 years.

Minneapolis/St. Paul route: Codesharing introduced in 1991. Gateway used for connections to 70 markets in inland United States. This route (together with DTT) is the epitome of codesharing; otherwise, there would be no "natural" traffic between the two cities (or a very limited one). Traffic has been growing dramatically. Frequency of service doubled in 1995. No competition on the route.

New York route: Codesharing introduced in 1994. NYC gateway not used for beyond gateway inland connecting services. Frequencies had already been reduced before introduction of codesharing services and have been further reduced (a frequency of 3 per day now compared to 5 per day in 1992). By elimination of TWA (TW), competition is now reduced to Delta (DL) and marginally to Tower Air (FF) and Martinair (MP) and to Fifth Freedom services by foreign carriers (significant since there were on average two such frequencies per day in 1995). In terms of traffic development, the agreement seems for the moment to have had the result of slightly increasing the share of KL in over-all traffic. Over-all traffic decreased in 1994 after a rise in 1993 (due to the introduction of competing services by FF and MP in addition to the new codeshared service KL/NW) resulting in no traffic growth from 1987 to 1991. From now on, the evolution of traffic is to be closely monitored. The success of routing connecting traffic through other gateways in the United States could well be to the detriment of the New York route.

Orlando route: Codesharing introduced in 1994 and rapidly withdrawn. This route is a special case where non-scheduled traffic still has a role to play. KL has been replaced by MP, more leisure-oriented.

San Francisco route: Codesharing introduced in 1994. SFO gateway not used for beyond gateway inland connecting services. No real direct competition. Direct services introduced in 1993 only. Too early to draw significant conclusions; however, a decrease was recorded in 1995.

Washington route: Codesharing introduced in 1994. WAS gateway not used for beyond gateway inland connecting services. Competition from UA. Direct services introduced in 1993 only. Very good start, but too early to draw significant conclusions. KL with 3 to 4 services per week carries slightly more traffic than the United States competitor with its daily service.

Conclusion: Codesharing does significantly increase traffic levels at gateways where connections are organized to feed and dispatch traffic. At all other airports, codeshared services do not seem to bring the same benefits.

Note.— The agreement between the two airlines was extended to Memphis in 1995 (with 40 points connected). This route may experience the same result as Detroit and Minneapolis, if the relationship between the two airlines continues for some time.

Appendix 2

IMPACT OF CODESHARING ON NORTH ATLANTIC TRAFFIC AT THE COUNTRY-PAIR, AIRPORT AND AIRLINE LEVELS

The following is a brief analysis of the impact of codesharing on North Atlantic traffic results and trends at three levels: country-pair traffic, airport traffic, and airline traffic.

COUNTRY-PAIR TRAFFIC — EVOLUTION OF AIR TRAFFIC IN THE FIVE MAIN EUROPE-UNITED STATES MARKETS

(Table A2-1 and Figure A2-1)

Table A2-1 and Figure A2-1 show that the over-all Europe-United States country-pair traffic has grown at different rates over the periods considered: 8.2 per cent yearly on average between 1985 and 1990[1], and 3.5 per cent between 1990 and 1995[2]. The introduction of codeshared services during the latter period does not therefore seem to have significantly altered the over-all volume of transatlantic traffic so far. However, one market (Kingdom of the Netherlands-United States) where codesharing is practised on a large scale has recorded a yearly growth rate far above the European average during the latter period (13.6 per cent as against 3.5 per cent), while a market where codesharing is not used (France-United States) recorded a lower than average yearly growth rate in the same period (3.3 per cent against 3.5 per cent), although in the former period it was ranked number one. It should be noted, however, that in spite of this poor performance in the latter years, this market is ranked second for over-all growth during the whole 1985-1995 period. This suggests that other factors play a significant role, such as the evolution of exchange rates, tourist interest, market appeal, the general context of individual countries' economy and, as far as air transport is specifically concerned, changes in seat supply, opening of new routes, increase in the number of air carriers, performance of airlines, airport preference, etc.

AIRPORT TRAFFIC

(Table A2-2)

How did total and North American traffic at the main European airports evolve over the past decade?

During the late 1980s, between 1985 and 1990, total traffic at the main European airports (London, Paris, Frankfurt, Amsterdam, Rome, Madrid and Zurich) recorded a sustained average growth ranging from 7 to 8.4 per cent p.a., Rome airport being an exception with only 5.5 per cent p.a. The ranking was led by Madrid airport.

After 1990 and up to the most recent full year for which statistical data are available (1995), the situation drastically changed. In terms of annual growth rate, Amsterdam airport jumped from the fifth to the first rank, with an average +8.8 per cent p.a., way ahead of all other contenders since the second airport (Frankfurt) recorded only

1. 1990 has been taken as a turning point not only in terms of changing decades, but also because it corresponds to a more widespread use of the codesharing technique in international markets.
2. With an over-all growth of 5.8 per cent for the whole 1985-1995 period.

+5.4 per cent. The range of annual changes for this group of airports is now much wider, from +0.3 per cent p.a. to +8.8 per cent p.a., thus suggesting that apparently diverging marketing strategies between airlines serving these airports might have had a greater impact than traditional factors affecting airport traffic growth.

If a longer perspective is taken, i.e. from 1985 to 1995, it can be seen that Amsterdam airport, because of its good performance in the most recent period, ranks first, with an 8 per cent average growth rate p.a., while Rome trails at the end of the list with +4.5 per cent.

If the analysis is restricted to traffic with North America (United States and Canada), Paris and Zurich airports appear as the most active, in terms of traffic development, during the 1985-1990 period, with an average annual growth between 7.5 and 10 per cent, while Amsterdam, for example, recorded a modest +4.6 per cent p.a. However, as with total traffic, the situation also changed for North American traffic during the 1990-1995 period: Amsterdam, thanks perhaps to its extensive use of codesharing services, in addition to its traditional reliance on "Sixth Freedom" services, ranked first with an impressive +11.2 per cent growth rate p.a., while Zurich, Rome and Madrid, airports where codesharing services are only marginally used, fell to very low levels of average growth. Surprisingly, however, Paris airport, where no codeshared flights with North America are operated[3], managed to reach second position, with a growth rate lower than Amsterdam but higher than Frankfurt and London.

Over the 10-year period (1985-1995), Paris airport remained ahead of Amsterdam airport in the growth of its North American traffic, notwithstanding the largely differing attitudes towards codesharing. The reasons for that performance are the same as those enumerated above for country-pair traffic.

AIRLINE TRAFFIC

(Tables A2-3 to A2-5, Figure A2-2 to A2-7)

Background

Tables A2-3 and A2-4 and Figures A2-2 through A2-6 show how individual airlines' and groups of airlines' North Atlantic traffic evolved during recent years for which information is available. From 1989 to 1995, European airlines as a group recorded the highest growth rate, with an average 6.2 per cent p.a., while North American airlines grew by an average 0.8 per cent p.a. European airlines were thus able to increase their share to 48.9 per cent of the total market in 1995, compared to 41.2 per cent in 1989. In the European group, airlines with the highest growth rates were Air France, British Airways, KLM and Lufthansa (average growth rates comprised between 7 and 11 per cent p.a.). In the North American group, important changes have occurred during the period (demise of Pan American which was, by far, the most important North Atlantic carrier; subsequent re-distribution of traffic rights to other carriers; new entrants), which make it difficult to establish proper comparisons, but over-all, the average growth rate was a mere 0.1 per cent p.a. for United States carriers and 7.2 per cent p.a. for Canadian carriers.

Impact of codesharing

Against this context, it is of interest to examine how transatlantic alliances fared during the period considered. Although these alliances were not in existence at the beginning of the period, Table A2-3 provides, for the sake of comparison, the evolution of the combined market share of the present major alliances over the whole period. It can be seen that the Lufthansa/United alliance, which had 6.2 per cent of the North Atlantic market in 1989, increased its share to 15.6 per cent in 1995. The British Airways/USAir alliance ranked second in terms of growth (from 12.2 per cent in 1989 to 17.6 per cent in 1995); in 1995, it recovered its first rank, having lost to United/Lufthansa in 1993 and 1994. The KLM/Northwest alliance progressed from 8.0 per cent in 1989 to 10.5 per cent in 1995. All of

3. Or just a few services, e.g. the Montreal-Paris route, which operate only during certain times of the year.

these alliances thus notably improved their market share, most likely to the detriment of other carriers, and this result is also likely attributable, at least in part, to the extensive practice of codesharing by the carriers involved.

Individually, however (see Table A2-5 and Figure A2-7), the situation varies according to partner carriers in the alliances. In the KLM/Northwest alliance, which was the first to be implemented, the European carrier had a 6.3 per cent annual average growth for its North Atlantic traffic prior to codesharing and experienced a 7.8 per cent growth rate subsequently, or a gain of 1.5 percentage points. The year 1995, however, suggested that the high growth rate years may be over for KLM since a mere 3.7 per cent growth was recorded for 1995, which is a growth rate under the average recorded before codesharing. When making the same calculations for partner Northwest, it can be seen that this carrier improved its annual traffic growth rate by 0.5 percentage point only. For Northwest, the year 1995 was even worse than for KLM, with a 1.7 per cent traffic decrease over 1994.

In the case of the British Airways/USAir alliance, the European carrier improved its differential traffic growth rate between the period before codesharing and the period with codesharing by 2.1 percentage points. It has to be noted that the growth rate recorded before codesharing was already very high at 8.3 per cent p.a. The year 1995 was even better, recording a growth rate of 14.2 per cent, which is 5.9 percentage points above the average before codesharing. The same calculations made for the United States partner are not very significant since USAir transatlantic traffic is very irregular, due to changing policies towards this market, and involves very low volumes. Furthermore, the operational scheme adopted for allocating traffic between partners of this alliance has not especially benefited the United States party.

In the case of the Lufthansa/United alliance, the last of the major transatlantic alliances to be implemented, the European carrier improved its traffic differential between the two periods by 5.4 percentage points (but this is based on only one year of observation for the period with codesharing). On the contrary, the first year of operation did not seem to be very conclusive for the United States partner, since its traffic actually declined. It should be acknowledged, however, that it is too early to draw significant conclusions for both partners.

As far as other carriers are concerned, the impact of codesharing during the period under consideration is not obvious, nor is it easy to identify, since carriers without codesharing (or with only marginal codesharing arrangements, such as point-to-point ventures on only one or a few route(s)) performed as well as carriers with such arrangements. Air France and Alitalia are cases in point (see Tables A2-3 and A2-4), in spite of ongoing restructuring difficulties which did not place them in the best position to compete with other carriers.

CONCLUSION

If codesharing initially brings additional traffic[4] on some routes, for some airports and for some carriers, this increase is by no means spectacular, when compared to other traffic vectors (country-pairs, airports and airlines), which are not, or little, affected by such practice. Furthermore, inasmuch as can be estimated by recent past experience, this traffic increase seems to be of short duration. This should be no surprise since traffic upsurge attributable to codesharing comes more from redistribution of traffic than from newly generated traffic, and the more alliances that are in existence, the less traffic there is to be redistributed. Finally, to date, the benefits appear to have been to the advantage of European carriers rather than to other carriers.

4. The part truly attributable to codesharing *per se* in a traffic increase is not easy to identify without detailed traffic reporting by air carriers.

Table A2-1. Evolution of air traffic in the five main Europe-United States markets

	Passengers (thousands)					
	France	*Germany*	*Italy*	*Kingdom of the Netherlands*	*United Kingdom*	*Europe*
1985	1 849.6	3 121.3	1 322.2	1 144.9	6 782.9	19 005.6
1986	1 778.8	3 151.3	980.3	1 145.6	6 298.9	17 821.1
1987	2 275.7	3 873.1	1 301.9	1 228.2	7 580.1	21 363.4
1988	2 675.1	4 296.4	1 376.5	1 309.9	8 460.2	23 961.5
1989	3 064.1	4 198.6	1 440.1	1 476.5	9 166.1	25 794.5
1990	3 402.7	4 805.3	1 523.0	1 613.7	10 068.9	28 207.0
1991	3 123.8	4 742.7	1 410.6	1 772.5	9 387.3	26 401.4
1992	3 695.4	5 423.9	1 857.8	2 004.0	10 895.8	30 280.7
1993	3 636.0	5 710.7	1 780.8	2 447.0	11 688.0	31 924.4
1994	3 912.9	5 668.2	1 871.0	2 745.5	12 005.6	33 358.6
1995	3 996.0	6 218.0	n.a	3 055.0	13 361.0	33 500.0
Average annual growth rate 1985-1990						
	13.0%	9.0%	2.9%	7.1%	8.2%	8.2%
Average annual growth rate 1990-1995*						
	3.3%	5.3%	5.3%	13.6%	5.8%	3.5%
** 1990-1994 for Italy*						
Average annual growth rate 1985-1995*						
	8.0%	7.1%	3.9%	10.3%	7.0%	5.8%
** 1985-1994 for Italy*						

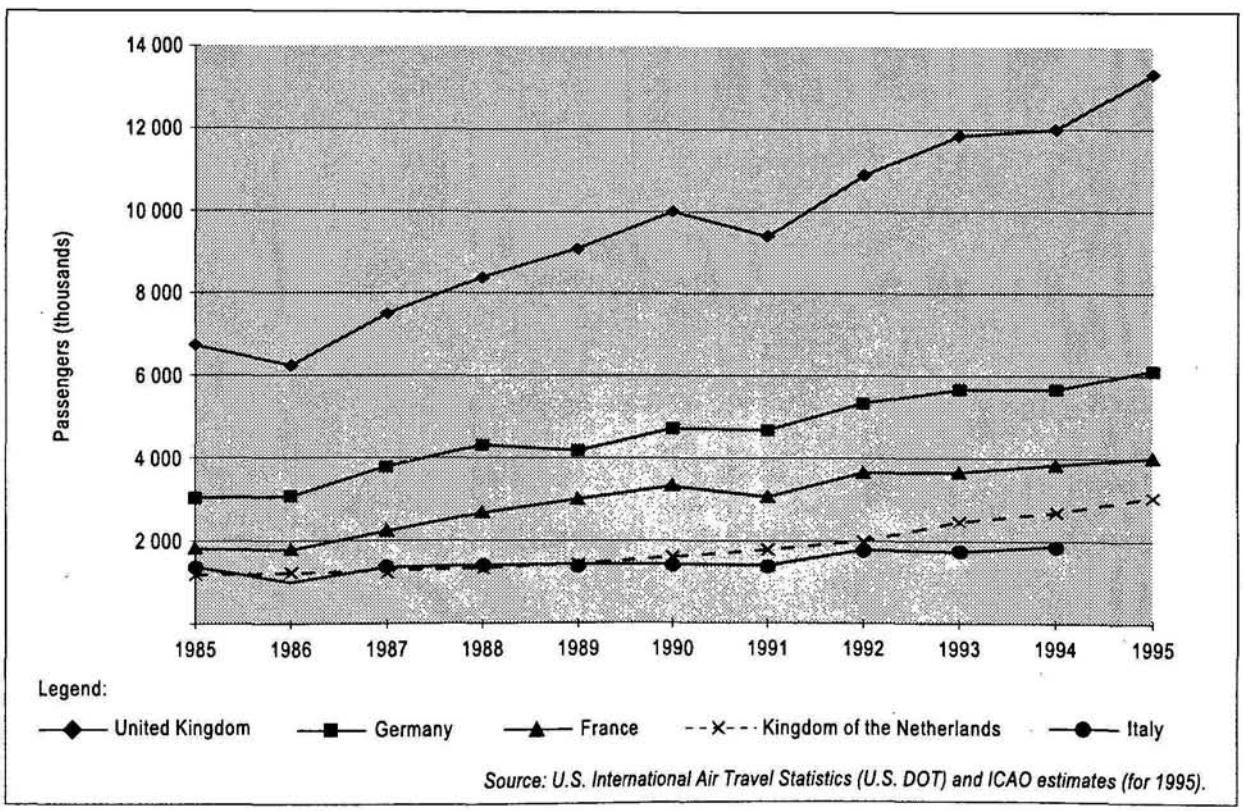

Figure A2-1. Evolution of traffic in the five main Europe-United States country-pair markets

Table A2-2. Evolution of passenger traffic at the main European airports — Yearly average change in passenger traffic growth (%)

	1985-1990	*1990-1995*	*1985-1995*	*1993-1994*	*1994-1995*
London (LON)					
Total	7.0	4.1	5.5	7.6	6.2
N.A.	6.2	4.8	5.5	3.5	11.1
Paris (PAR)					
Total	7.4	3.3	5.3	7.4	– 0.5
N.A.	9.5	6.4	8.0	10.5	3.3
Frankfurt (FRA)					
Total	7.7	5.4	6.6	7.9	8.7
N.A.	6.6	4.7	5.6	3.9	9.0
Amsterdam (AMS)					
Total	7.2	8.8	8.0	11.1	7.7
N.A.	4.6	11.2	7.8	9.3	10.6
Rome (ROM)					
Total	5.5	3.5	4.5	5.5	4.2
N.A.	– 0.9	1.2	0.1	14.9	0.7
Madrid (MAD)					
Total	8.4	4.0	6.2	4.9	8.3
N.A.	4.6	0.5	2.5	5.0	1.3
Zurich (ZRH)					
Total	7.7	0.3	5.5	7.3	13.1
N.A.	7.6	2.8	5.1	– 1.6	14.0

Note.— Traffic with North America (N.A.) includes United States and Canada.
Source: National civil aviation administrations and ICAO.

RANKINGS

	1985-1990 total traffic			1990-1995 total traffic			1985-1995 total traffic		
1	MAD	8.4	1	AMS	8.8	1	AMS	8.0
2	ZRH	7.7	2	FRA	5.4	2	FRA	6.6
	FRA	7.7	3	LON	4.1	3	MAD	6.2
4	PAR	7.4	4	MAD	4.0	4	LON	5.5
5	AMS	7.2	5	ROM	3.5		ZRH	5.5
6	LON	7.0	6	PAR	3.3	6	PAR	5.3
7	ROM	5.5	7	ZRH	0.3	7	ROM	4.5

	1985-1990 North American traffic			1990-1995 North American traffic			1985-1995 North American traffic	
1	PAR	9.5	1	AMS	11.2	1	PAR	8.0
2	ZRH	7.6	2	PAR	6.4	2	AMS	7.8
3	FRA	6.6	3	LON	4.8	3	FRA	5.6
4	LON	6.2	4	FRA	4.7	4	LON	5.5
5	AMS	4.6	5	ZRH	2.8	5	ZRH	5.1
	MAD	4.6	6	ROM	1.2	6	MAD	2.5
7	ROM	–0.9	7	MAD	0.5	7	ROM	0.1

Table A2-3. Evolution of passenger traffic and market share of the main carriers on the North Atlantic (scheduled services)

Carrier	1989		1990		1991		1992		1993		1994		1995	
	Passengers (thousands)	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*	*Passengers (thousands)*	*Market share (%)*
Aer Lingus	469.0	1.7	477.4	1.6	384.0	1.5	433.8	1.4	412.5	1.3	517.2	1.5	557.7	1.7
Air Canada	983.8	3.5	1 056.8	3.5	941.0	3.6	1 135.3	3.7	1 123.0	3.5	1 422.7	4.2	1 498.9	4.5
Air France	909.1	3.3	930.4	3.1	1 219.6	4.7	1 102.4	3.6	1 236.2	3.9	1 489.8	4.4	1 650.3	4.9
Air Portugal	231.4	0.8	243.0	0.8	207.0	0.8	229.4	0.8	220.9	0.7	196.4	0.6	115.4	0.3
Alitalia	719.6	2.6	758.1	2.5	704.3	2.7	976.0	3.2	963.6	3.0	1 015.0	3.0	1 069.3	3.2
American	1 466.2	5.3	1 816.4	6.0	2 166.7	8.4	3 096.5	10.2	3 282.7	10.3	3 393.9	10.1	3 646.7	10.8
Austrian	41.9	0.2	60.0	0.2	58.3	0.2	107.4	0.4	124.9	0.4	140.5	0.4	110.3	0.3
British	3 288.7	11.8	3 781.2	12.6	3 519.6	13.6	4 118.1	13.6	4 519.4	14.2	4 826.4	14.4	5 511.1	16.4
Canadian	443.2	1.6	717.1	2.4	584.4	2.3	627.2	2.1	677.4	2.1	666.0	2.0	663.2	2.0
Continental	791.6	2.8	660.2	2.2	705.1	2.7	1 065.3	3.5	1 108.6	3.5	1 064.2	3.2	934.7	2.8
CSA	32.0	0.1	40.2	0.1	51.2	0.2	76.7	0.3	85.0	0.3	94.5	0.3	115.2	0.3
Delta	940.9	3.4	1 165.8	3.9	1 636.6	6.3	3 760.2	12.4	4 245.4	13.3	4 658.6	13.9	4 314.9	12.8
Iberia	453.3	1.6	453.4	1.5	388.1	1.5	480.9	1.6	429.4	1.3	402.1	1.2	412.1	1.2
JAT	203.1	0.7	234.8	0.8	130.3	0.5	28.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
KLM	1 381.1	5.0	1 469.0	4.9	1 560.9	6.0	1 750.6	5.8	1 964.4	6.2	2 029.6	6.0	2 105.6	6.3
Lufthansa	1 736.3	6.2	2 019.5	6.7	1 945.1	7.5	2 112.4	7.0	2 239.1	7.0	2 335.8	7.0	2 604.6	7.7
Northwest	847.9	3.0	931.8	3.1	1 001.4	3.9	1 250.8	4.1	1 391.0	4.4	1 448.7	4.3	1 423.5	4.2
Olympic	216.6	0.8	204.7	0.7	158.4	0.6	203.4	0.7	223.4	0.7	226.2	0.7	262.0	0.8
Pan American	6 486.0	23.3	6 576.8	21.9	2 063.7	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sabena	348.8	1.3	433.4	1.4	212.3	0.8	260.5	0.9	220.9	0.7	271.0	0.8	300.7	0.9
SAS	634.7	2.3	641.1	2.1	580.5	2.2	571.1	1.9	607.1	1.9	582.4	1.7	563.7	1.7
Swissair	789.1	2.8	809.7	2.7	789.7	3.1	832.3	2.7	863.6	2.7	914.4	2.7	956.7	2.8
THY	37.6	0.1	50.1	0.2	42.1	0.2	66.3	0.2	77.4	0.2	87.0	0.3	110.7	0.3
Tower Air	259.3	0.9	226.1	0.8	332.7	1.3	463.1	1.5	624.5	2.0	933.5	2.8	0.0	0.0
TWA	4 048.9	14.5	3 967.9	13.2	2 724.6	10.6	2 567.8	8.5	1 827.5	5.7	1 713.1	5.1	1 677.8	5.0
United	0.0	0.0	135.4	0.5	1 471.2	5.7	2 474.5	8.2	2 917.8	9.1	2 844.9	8.5	2 635.8	7.8
USAir	100.2	0.4	170.9	0.6	239.0	0.9	506.5	1.7	541.5	1.7	327.4	1.0	398.4	1.2
Total	27 860.3	100.0	30 031.2	100.0	25 817.8	100.0	30 297.0	100.0	31 927.2	100.0	33 601.3	100.0	33 639.3	100.0
Alliances														
BA/US	3 388.9	12.2	3 952.1	13.2	3 758.6	14.6	4 624.6	15.3	5 060.9	15.9	5 153.8	15.3	5 909.5	17.6
KL/NW	2 229.0	8.0	2 400.8	8.0	2 562.3	9.9	3 001.4	9.9	3 355.4	10.5	3 478.3	10.4	3 529.1	10.5
LH/UA	1 736.3	6.2	2 154.9	7.2	3 416.3	13.2	4 586.9	15.1	5 156.9	16.2	5 180.7	15.4	5 240.4	15.6
North American airlines	16 368.0	58.8	17 425.2	58.0	13 866.4	53.7	16 947.2	55.9	17 739.4	55.6	18 473.0	55.0	17 193.9	51.1
European airlines	11 492.3	41.2	12 606.0	42.0	11 951.4	46.3	13 349.8	44.1	14 187.8	44.4	15 128.3	45.0	16 445.4	48.9

Note.— The data shown for the United States carriers are for the "Atlantic entity"; hence, they also include traffic between North America and the Middle East/Africa, as well as traffic between and within Europe, the Middle East and Africa. For the United States carriers as a group, this traffic represented some 25% of the "Atlantic entity" in 1989 but only about 10% in 1995.

Source: ICAO, AEA and U.S. DOT.

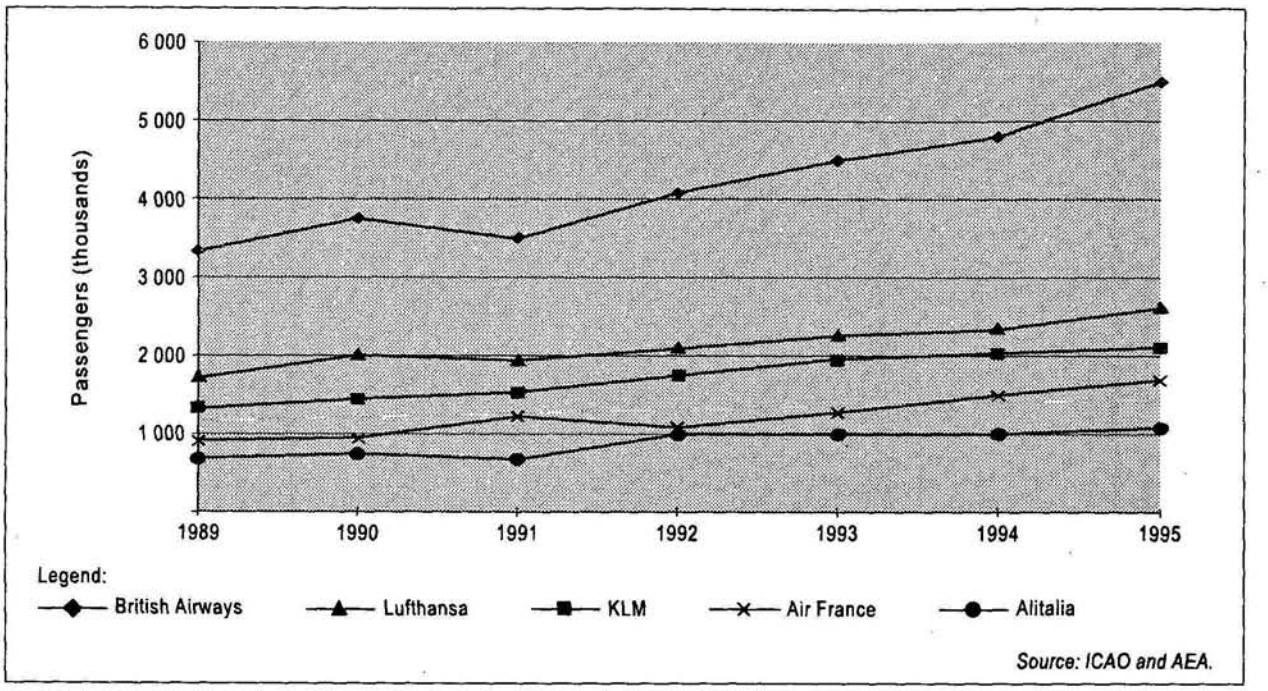

Figure A2-2. European airlines with North Atlantic traffic over 1 000 000 passengers in 1995 (scheduled services)

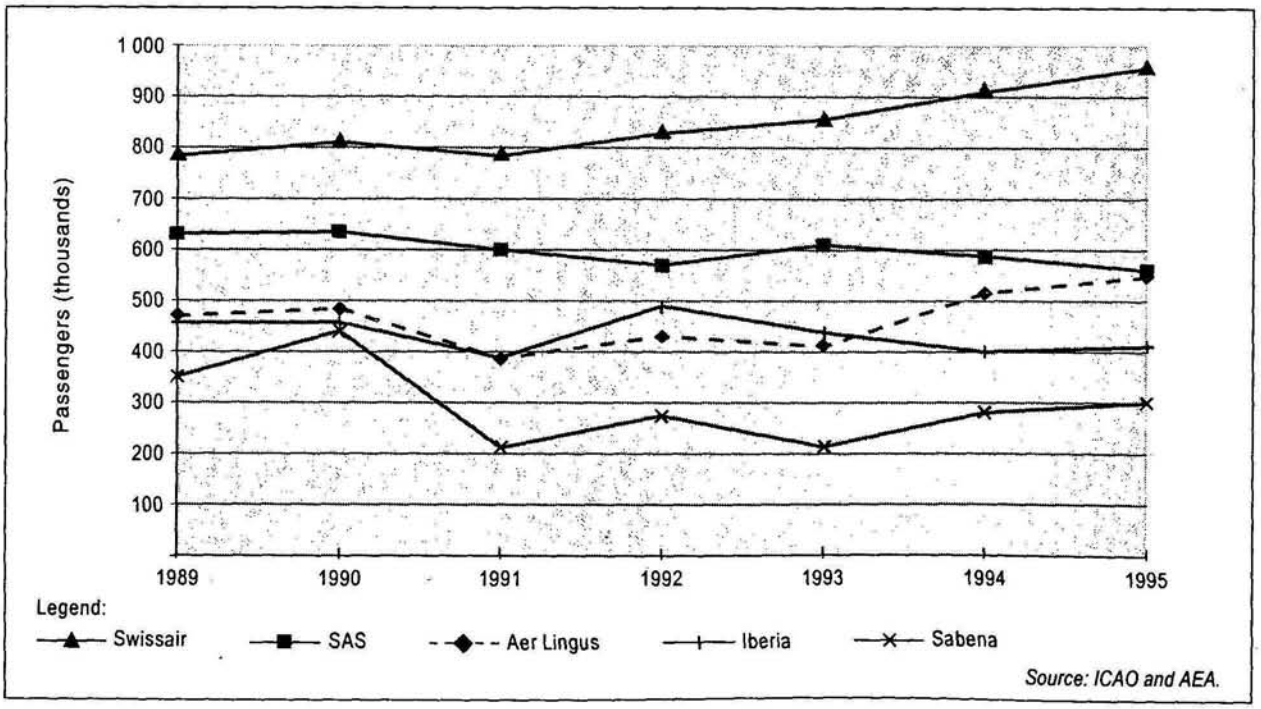

Figure A2-3. European airlines with North Atlantic traffic between 300 000 and 1 000 000 passengers in 1995 (scheduled services)

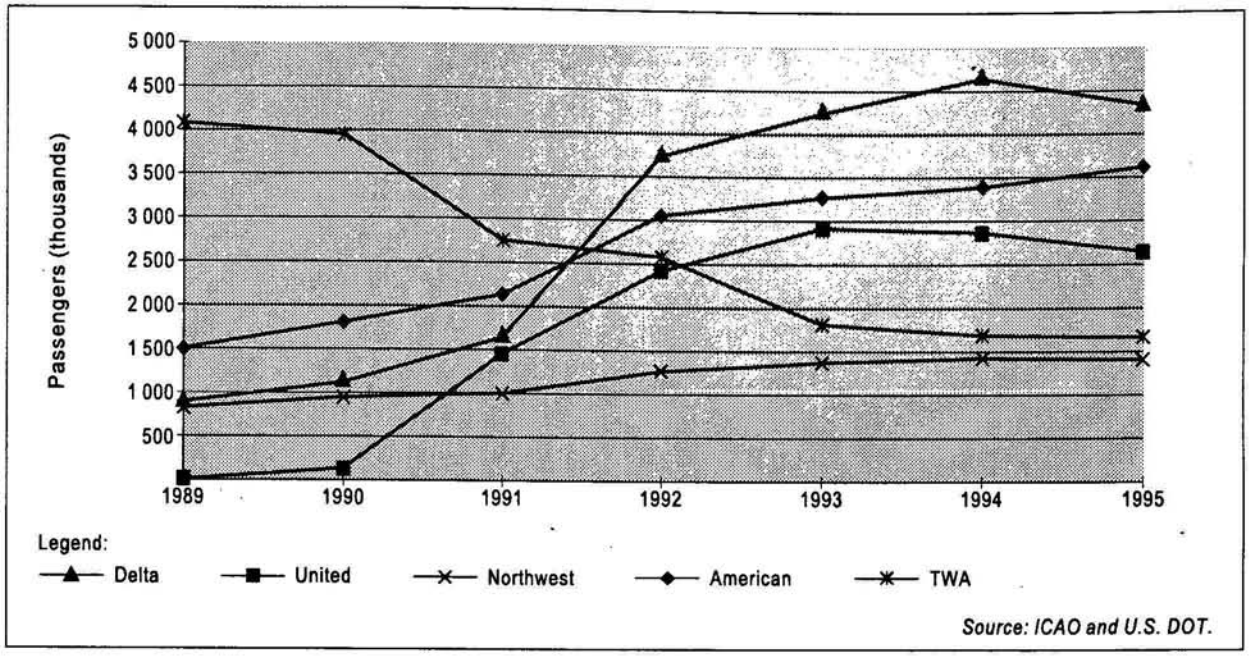

Figure A2-4. U.S. airlines with North Atlantic traffic over 1 000 000 passengers in 1995 (scheduled services)

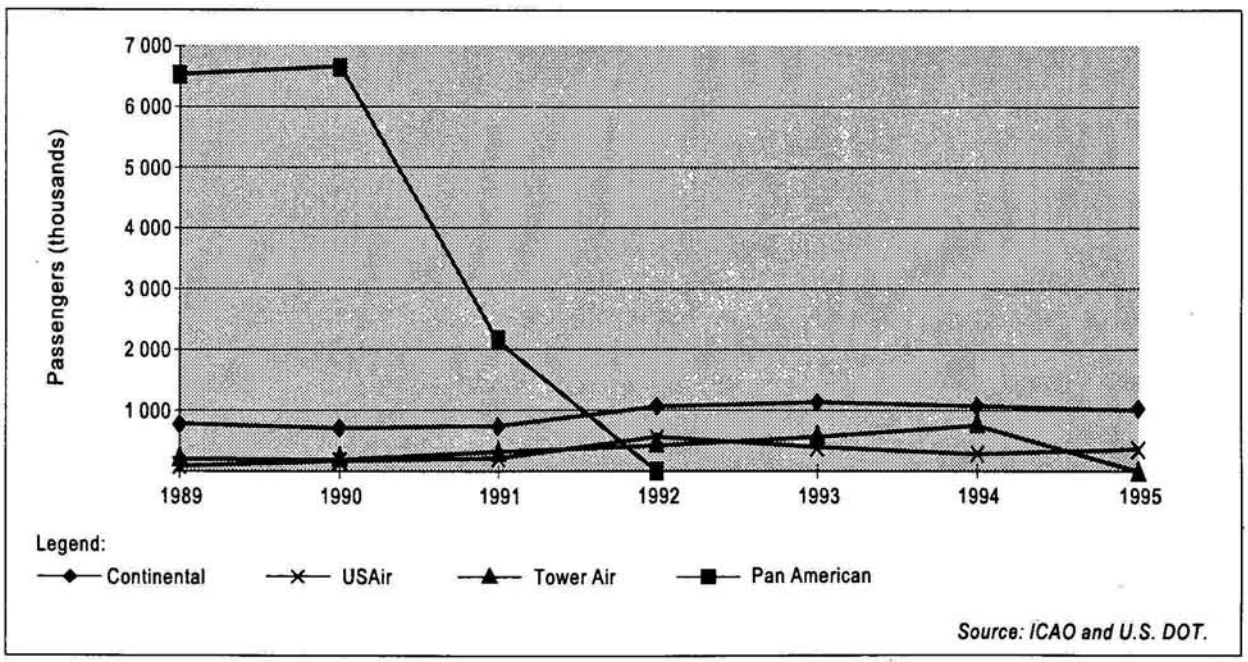

Figure A2-5. U.S. airlines with North Atlantic traffic under 1 000 000 passengers in 1995 (scheduled services)

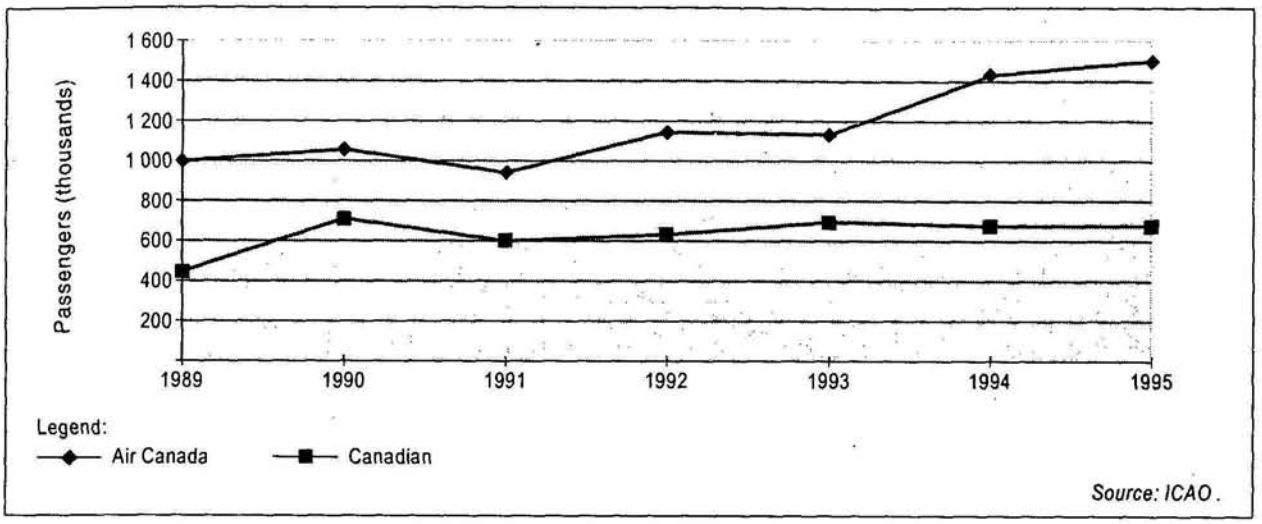

Figure A2-6. Canadian airlines (scheduled services)

Table A2-4. Growth of North Atlantic traffic for major carriers over the 1989-1995 period (carriers with scheduled passenger traffic over 300 000 in 1995)

Carrier	*Annual growth rate (%)*	*Notes*
Delta	28.9	Strong over-all growth due to low level in 1989. Growth rate of 4.7% p.a. since 1992
USAir	25.9	Irregular traffic and low volumes
American	16.4	Strong over-all growth due to low level in 1989. Growth rate of 5.6% p.a. since 1992
Air France	10.4	Regular upward trend
British Airways	9.0	Regular upward trend
Northwest	9.0	Regular upward trend, but traffic level stable since 1993
KLM	7.3	Regular upward trend
Air Canada	7.3	Regular upward trend
Lufthansa	7.0	Regular upward trend
Canadian	6.9	Stable traffic since 1993
Alitalia	6.8	Regular upward trend
Swissair	3.3	Regular upward trend
Aer Lingus	2.9	Upward trend since 1994
Continental	2.8	Decreasing trend since 1993
All United States carriers*	0.1	
Iberia	–1.6	Decreasing trend since 1992
SAS	–2.0	Decreasing trend since 1990
Sabena	–2.4	Irregular traffic showing signs of rebound since 1994
United	ns	Started operating in the North Atlantic in 1990. 2.2% average growth since 1992, but decreasing trend since 1993

Source: ICAO, AEA and U.S. DOT.
ns: not significant
** Regrouped because of important changes experienced by individual carriers during the period under consideration (demise of Pan Am, transfer of traffic rights among operators, new entrants).*

Table A2-5. Alliances' traffic over the North Atlantic

	Passengers (thousands)						
	1989	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
KL	1 381	1 469	1 561	1 751	1 964	2 030	2 106
NW	848	932	1 001	1 250	1 391	1 448	1 423
KL/NW	**2 229**	**2 401**	**2 562**	**3 001**	**3 355**	**3 478**	**3 529**
BA	3 288	3 781	3 520	4 118	4 519	4 827	5 512
US	100	171	239	507	542	327	398
BA/US	**3 388**	**3 952**	**3 759**	**4 625**	**5 061**	**5 154**	**5 910**
LH	1 736	2 020	1 945	2 112	2 239	2 336	2 604
UA	0	135	1 471	2 475	2 918	2 845	2 636
LH/UA	**1 736**	**2 155**	**3 416**	**4 587**	**5 157**	**5 181**	**5 240**

Annual change in traffic carried, over characteristic periods

	Before codesharing services (%)	*With codesharing services* (%)*	*1995*	*For whole period*
KL	6.3	7.8	3.7	7.3
NW	8.7	9.2	–1.7	9.0
KL/NW	**7.2**	**8.3**	**1.5**	**8.0**
** First codesharing services introduced in 1991*				
BA	8.3	10.4	14.2	9.0
US	52.5	–14.2	21.7	25.9
BA/US	**10.6**	**8.1**	**14.7**	**9.7**
** First codesharing services introduced in 1993*				
LH	6.1	11.5	11.5	7.0
UA	ns	–7.3	–7.3	ns
LH/UA	**ns**	**1.2**	**1.2**	**ns**
** First codesharing services introduced in 1994*				

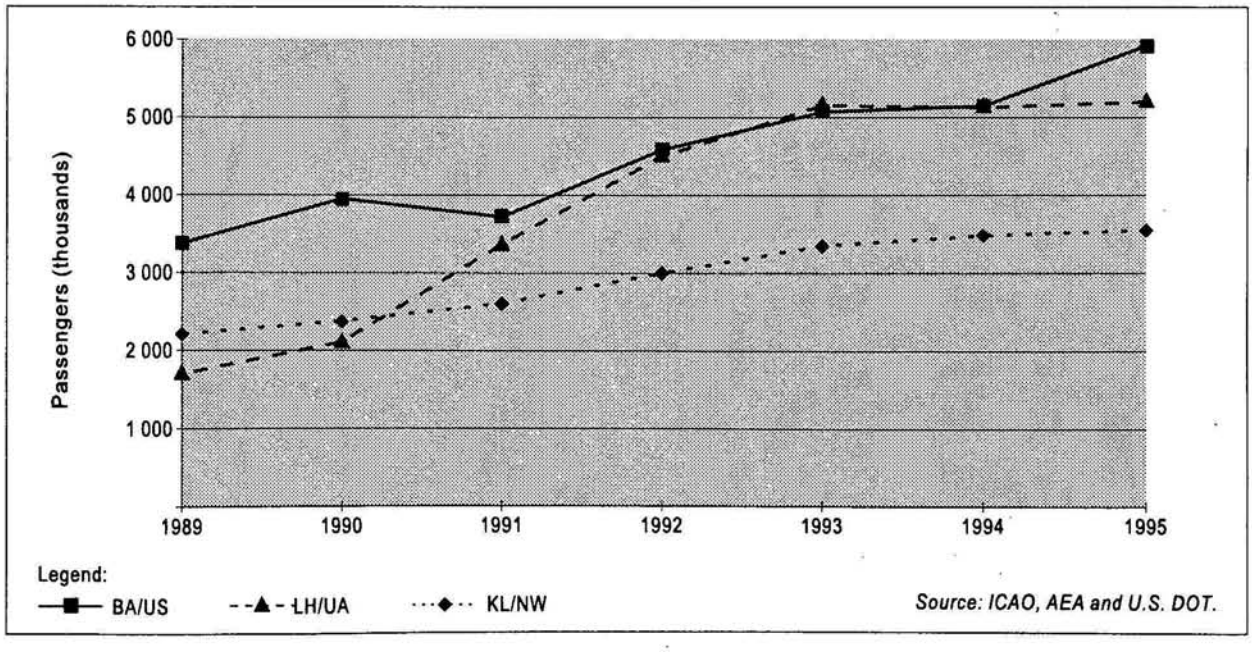

Figure A2-7. Alliances' North Atlantic traffic

Appendix 3

EXTRACT FROM THE ECAC RECOMMENDATION ON CONSUMER INFORMATION/PROTECTION IN CONNECTION WITH CODESHARED SERVICES[1]

The Conference recommends that:

1. Carriers holding out codeshared services to the public should ensure that before making a booking or reservation, potential passengers are made aware of the existence of the codeshare and given additional information on the main features of the arrangement, including in all cases the name of the actual operator of each segment of a flight;

2. Ways and means should be found to ensure that, before travelling, and at the latest at the time of ticket issue, the passenger is given in written form confirmation of the actual operator for each segment of a flight and other information (e.g. airport terminal(s), check-in area(s), transfer point(s)) that will facilitate the passenger's travel;

3. Airport authorities, in co-operation with codesharing carriers and handling agents, should take all possible measures through information displays on Arrivals and Departures Boards, Signposting, Check-in Displays, etc. to assist the passenger's travel;

4. Where necessary during a journey (e.g. in the case of denied boarding, missed connections, delayed departures, mislaid baggage), appropriate measures should be taken to ensure that passengers are fully informed and given clear guidance and support by the contracting carrier, or, in his name, by the operator or their agents;

5. Where matters remain to be resolved after a journey has been completed, the passenger should be given clear information as regards the carrier with whom communications should be pursued; in any event the passenger should be given the opportunity to appeal to any of the carriers participating in the flight (either contracting carrier or operator) according to choice;

6. In view of the complementary roles played by airlines, travel agents and CRS vendors and other data providers in the marketing and selling of codeshare products, all concerned should co-operate in finding effective and cost efficient arrangements to ensure that passengers are not misled about the nature of the services being offered. The industry should take advantage of the opportunities becoming available to provide more accurate and user-friendly information and, in particular, give urgent and serious consideration to implementing the following:

    a. presentation of data in a more user-friendly way — for example by including the codes of both codeshare partners in the same entry on the CRS screen;

    b. greater provision of information on codeshare products, both by carriers and by CRS operators to enable sales personnel to describe services accurately;

1. This Recommendation was adopted at a Plenary Meeting on 26 June 1996.

c. provide information on codeshares on the face of the ticket where economically and practically feasible;

d. where electronic means are used to store or transfer travel information, data on codeshares should be included so that the operator of a codeshared flight can be clearly shown on any subsequent display of the information.

Appendix 4

ASSESSMENT OF FLIGHT OPTIONS AND FARES OFFERED TO CUSTOMERS ON A SAMPLE OF ROUTES

Examples of flight options offered in CRS on five North Atlantic routes for which no direct service exists have been examined in order to check the position given to codeshared services compared to other interlining services[1].

The basic information comes from listings provided by a CRS for a journey on a given date, with two or three segments requested; no other specific request has been made (for example for preferred airlines or airports). The tables in this appendix rank flights options according to total elapsed time,[2] with the CRS original ranking shown on the same line for the purpose of comparison.

This exercise also permits a check of the competitiveness of different airline alliances and different hubs on the routes considered.

First example: from Indianapolis, Indiana (United States) to Lyons (France)
(see Table A4-1)

Flight options

One hundred and twenty-three different flight options were provided in the CRS when the request was made for a journey to be performed between the two above-mentioned cities on 18 October 1995. When examining these options in detail, it appeared, however, that the number of routings is only 100, once duplications created by codesharing flights are eliminated; the "swamping index" can thus be set at 1.23[3].

There is no non-stop flight between the two cities, nor multi-stop online flight. The travel has thus to be made through connections in two gateways on both sides of the Atlantic Ocean. Most, if not all, possibilities offered therefore imply three segments: (a) from Indianapolis to an American gateway, (b) from an American gateway to a European gateway, and (c) from the European gateway to Lyons. A great number of theoretical options are therefore opened.

When total elapsed time is retained as the only criterion to make a choice among all options, it is to be noted that the best offers[4] come from interlining combinations[5] and not from codesharing combinations. The best codesharing

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1. The situation presented is the one in existence at the date of the requests made to the CRS; it may happen that connecting schedules have been rearranged for subsequent aeronautical seasons, or new services created, or new alliances put into place.
2. Because it is considered to be more convenient for the passenger.
3. This index is the ratio of total options offered in the CRS to the number of different routings.
4. On the Sabre default display, it is only at the 13th screen that the best option is offered, which makes it somewhat difficult to be chosen by the customer.
5. There are three different types of interlining combinations:
   — implying independent airlines (the traditional interlining);
   — implying independent airlines and codesharing airlines, on one or two segments of the journey;
   — implying a combination of codesharing airlines (from different alliance groupings), on one, two or three segments of the journey. *(This latter type is not a fully-fledged codesharing option, but a combination of segments operated by different codesharing groupings interlining between them.)*

combination appears at the 22nd rank only (out of 100), or on the ninth screen of the CRS default display, and the second best at the 53rd rank, with the balance of codesharing options ranging from 58th to 97th ranks, the bulk of them being at the bottom of the table.

Total elapsed time for the journey varies from 12:45 hours to over 32 hours, and total time spent in transit is longer than airborne time for 2/3 of the options. Actual consolidated flight time ranges from 6 hours (in a combination involving a supersonic aircraft) to around 9 hours for the majority of cases.

As far as major transatlantic alliances are concerned, it is to be noted that the Northwest/KLM alliance offers the greatest number of options (10), and the USAir/British Airways alliance only two, while the United/Lufthansa alliance is totally absent from this market, and the Delta/Virgin alliance appears only on the transatlantic segment, but not on the beyond gateways segments. Taken together, end-to-end codesharing options represent 11 per cent of the different routings.

Fares

According to information provided in the CRS, four levels of tariffs are offered to the public (lowest one-way Y fare without restriction): $1 209, $1 266, $1 301 and $1 365. The most expensive fares are offered by Canadian International and Delta Airlines. Most of the carriers in the price listing (not reproduced in this circular) do not even appear in the list of possible flight options. Airlines that are members of a major transatlantic alliance offer the second highest fares. There is, therefore, apparently no pricing advantage in using a codeshared service on this route.

Conclusion

A CRS that would retain the option of online preference, to which codesharing is associated, would saturate the first screens with codesharing flight options, the best of which is slower by three hours than the best interlining option. In addition, fares for these services would be the second highest among those offered.

Second example: from Nashville, Tennessee (United States) to London (United Kingdom)
(see Table A4-2)

One hundred and sixty-three options are offered on CRS screens, of which 151 are different routings, once duplications created by codesharing flights are eliminated. The "swamping index" on this route is established at 1.08.

In terms of total elapsed time, the best offers are provided by combinations of traditional interlining, or by online connections offered by American airlines connecting a domestic flight to an international service at one of their gateways. The best option from codesharing partners comes at the 8th rank, with a time duration greater by 35 minutes than the best non-codesharing option[6]. End-to-end codesharing options, which are displayed on one or two lines only[7], are offered by the following groupings: BA/United States (7), VS/DL (7), CP/AA (3) and AC/UA (1). Taken together, they represent 12 per cent of the different routings.

As far as tariffs are concerned, the 26 airlines in the price listing offer fares ranging from $1 198 (lowest one-way Y fare without restriction) to $1 538, the average being $1 494. Fares offered by the codesharing groupings range from $1 494 to $1 538.

6. For a fair comparison, combinations involving supersonic aircraft are not taken into consideration in this case.
7. Which explains why the "swamping index" for this example is low, compared to others.

Third example: from Kansas City, Missouri (United States) to Munich (Germany)
(see Table A4-3)

One hundred and thirty-eight options are offered on CRS screens, of which 82 are different routings, once duplications created by codesharing flights are eliminated. The "swamping index" on this route is established at 1.68.

In terms of total elapsed time, the best offer is provided by an end-to-end codesharing option, with a one hour and 10 minute advantage over the best non-codesharing option (an online connection). Codesharing options, which are displayed on one, two, three or even four lines[8] of CRS screen, are offered by the following groupings: KL/NW (12), LH/UA (4), and BA/United States (1). Taken together, they represent 21 per cent of the different routings.

As far as tariffs are concerned, the 27 airlines in the price listing offer fares ranging from $1 326 (lowest one-way Y fare without restriction) to $1 614, the average being $1 600. Fares offered by the codesharing groupings are all at $1 614.

Fourth example: from Seattle, Washington (United States) to Cairo (Egypt)
(see Table A4-4)

One hundred and eighteen options are offered on CRS screens, of which 71 are different routings, once duplications created by codesharing flights are eliminated. The "swamping index" on this route is established at 1.66.

In terms of total elapsed time, the best offers are provided by combinations of traditional interlining, or by online connections ("Sixth Freedom" service). The best option from codesharing partners comes at the 5th rank, with a time duration greater by 2 hours and 30 minutes than the best non-codesharing option. End-to-end codesharing options, which are displayed on two, three or four lines[9], are offered by the following groupings: LH/UA (7), KL/NW (6) and CP/LH (1). Taken together, they represent 20 per cent of the different routings.

As far as tariffs are concerned, the 31 airlines in the price listing offer fares ranging from $1 925 (lowest one-way Y fare without restriction) to $2 314, the average being $2 260. Fares offered by the codesharing groupings range from $2 275 to $2 314.

Fifth example: from Guadalajara (Mexico) to Warsaw (Poland)
(see Table A4-5)

Seventy-two options are offered on CRS screens, of which 71 are different routings, once duplications created by codesharing flights are eliminated. The "swamping index" on this route is nil.

In terms of total elapsed time, the best offers are provided by combinations of partial codesharing[10] and traditional interlining or by traditional interlining on its own.

As far as tariffs are concerned, all airlines operating on this routing offer the same fare, at $1 698 (lowest one-way Y fare without restriction).

8. Which explains why the "swamping index" for this example is high. It is to be noted, however, that on three-leg journeys operated by two codesharing partners, the theoretical number of combinations is 8.
9. Which explains why the "swamping index" for this example is high.
10. There is no codesharing option available from end to end on this route.

CONCLUSION

From an analysis of these cases, chosen on a random basis, the following conclusions, specific to the codesharing practice, are offered; they are accompanied by comments of a more general nature regarding the information itself and the way in which it is presented to the public.

- Flight options proposed under end-to-end codesharing arrangements are seldom the fastest in terms of total elapsed time.

- Screen padding seems to be more readily used by certain airline groupings than by others.

- There is no consistency in the number of codesharing flight options displayed (from 1 to 4 times, out of a potential total of 8, when two airlines and three-leg journeys are involved).

- From available information, it appears that through fares proposed under codesharing arrangements are not the cheapest compared to those proposed by individual carriers operating on the same route under either interline or "Sixth Freedom" services.

- Some airlines and some airports seem all too often ignored when their services would be as convenient as those competitively proposed; as a consequence, some hubs, and airlines serving them, are bypassed.

- In some of the cases examined, routings proposed may be longer by up to 23 per cent, in terms of mileage, than the shortest option available (as far as codesharing is specifically concerned, the longest routings are 14 per cent longer than the shortest option).

- It seems surprising that flight options may be offered when their total elapsed time is 3 or 4 times longer than the fastest available; among the most questionable options are those where a supersonic aircraft is used for one of the legs of the journey, while during the same journey an overnight stay has to be made at one of the transit stops.

- Some of the options proposed include transit times that are obviously excessive, compared to the over-all length of the journey, unless it has been explicitly mentioned by the passenger that he or she wishes to spend a long time in a transit point for a specific purpose.

- Some of the options proposed in the two-leg category, and therefore benefiting from a better display on CRS screens, end up actually having three legs, because of an en-route stop or change of gauge, and take much longer than options listed after them.

Table A4-1. INDIANAPOLIS — LYONS

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
1	25	IND-CVG	DL	73S	CVG-ORY	DL	L15	ORY-LYS	IT	320	12:45
2	7	IND-ORD	**AA**	AT7	ORD-LHR	AA	767	LHR-LYS	AF	737	13:10
2	36	IND-CVG	DL	73S	CVG-ORY	DL	L15	CDG-LYS	AF	CRJ	13:10
4	5	IND-YYZ	**AC**	DH1	YYZ-LHR	BA	741	LHR-LYS	AF	737	13:15
5	4	IND-EWR	CO	733	EWR-LHR	BA	741	LHR-LYS	AF	737	13:25
6	3	IND-ORD	**AA**	AT7	ORD-ORY	AA	763	ORY-LYS	IT	320	13:30
7	1	IND-ORD	UA	73S	ORD-CDG	AF	763	CDG-LYS	AF	CRJ	14:10
7	2	IND-ORD	UA	73S	ORD-CDG	UA	763	CDG-LYS	AF	CRJ	14:10
9	6	IND-YYZ	**US**	SF3	YYZ-LHR	BA	741	LHR-LYS	AF	737	14:15
10	9	IND-LGA	US	100	JFK-ORY	AA	763	ORY-LYS	IT	320	14:30
10	10	IND-LGA	US	100	EWR-ORY	CO	D10	ORY-LYS	IT	320	14:30
12	8	IND-BOS	US	733	BOS-LGW	NW	D10	LGW-LYS	**BA**	F28	15:05
12	11	IND-BOS	**BA**	EQV	BOS-LGW	VS	747	LGW-LYS	**BA**	F28	15:05
12	15	IND-BOS	**BA**	EQV	BOS-LGW	**DL**	747	LGW-LYS	**BA**	F28	15:05
12	12	IND-BOS	US	733	BOS-LGW	**DL**	747	LGW-LYS	**BA**	F28	15:05
12	14	IND-BOS	US	733	BOS-LGW	VS	747	LGW-LYS	**BA**	F28	15:05
12	13	IND-BOS	**BA**	EQV	BOS-LGW	NW	D10	LGW-LYS	**BA**	F28	15:05
12	16	IND-YYZ	**US**	SF3	YYZ-FRA	LH	747	FRA-LYS	LH	737	15:05
17	38	IND-YYZ	**AC**	DH1	YYZ-CDG	CP	763	ORY-LYS	IT	320	15:25
17	47	IND-ORD	**AA**	AT7	ORD-BRU	AA	763	BRU-LYS	SN	F28	15:25
19	22	IND-JFK	TW	72S	JFK-ORY	AA	763	ORY-LYS	IT	320	15:30
19	24	IND-JFK	TW	72S	EWR-ORY	AF	747	ORY-LYS	IT	320	15:30
21	37	IND-EWR	CO	733	JFK-ORY	PK	74M	ORY-LYS	IT	320	15:35
22	17	IND-DTW	**US**	SWM	DTW-AMS	**KL**	D10	AMS-LYS	KL	100	15:40
22	19	IND-DTW	**US**	SWM	DTW-AMS	NW	D10	AMS-LYS	KL	100	15:40
22	18	IND-DTW	NW	D9S	DTW-AMS	NW	D10	AMS-LYS	KL	100	15:40
22	20	IND-DTW	NW	D9S	DTW-AMS	KL	D10	AMS-LYS	KL	100	15:40
22	21	IND-DTW	KL	D9S	DTW-AMS	KL	D10	AMS-LYS	KL	100	15:40
24	28	IND-YYZ	**AC**	DH1	YYZ-CDG	CP	763	CDG-LYS	AF	CRJ	15:50
25	55	IND-ORD	**AA**	AT7	ORD-LHR	AA	M11	LHR-LYS	AF	737	15:55
26	61	IND-ORD	**AA**	AT7	ORD-LHR	AA	M11	LHR-LYS	UA	737	16:15
27	23	IND-YYZ	**US**	SF3	YYZ-LHR	BA	741	LHR-LYS	AF	737	16:25
27	46	IND-YYZ	**US**	SF3	YYZ-CDG	CP	763	ORY-LYS	IT	320	16:25
29	29	IND-ORD	UA	73S	ORD-ORY	AA	763	ORY-LYS	IT	320	16:42
30	26	IND-CVG	DL	M88	CVG-ORY	DL	L15	ORY-LYS	IT	320	16:45
30	30	IND-JFK	DL	M88	JFK-ORY	PK	74M	ORY-LYS	IT	320	16:45
32	27	IND-YYZ	**AC**	DH1	YYZ-FRA	LH	747	FRA-LYS	LH	737	16:50
32	35	IND-YYZ	**US**	SF3	YYZ-CDG	CP	763	CDG-LYS	AF	CRJ	16:50
34	48	IND-ORD	**AA**	AT7	ORD-BRU	AA	763	BRU-LYS	SN	F28	16:55
34	51	IND-EWR	**US**	SF3	EWR-ORY	CO	D10	ORY-LYS	IT	320	16:55
34	53	IND-EWR	**US**	SF3	EWR-ORY	AF	747	ORY-LYS	IT	320	16:55
37	50	IND-ORD	UA	733	ORD-BRU	AA	763	BRU-LYS	SN	F28	17:00
38	32	IND-EWR	CO	73S	EWR-ORY	AF	747	ORY-LYS	IT	320	17:05
38	33	IND-EWR	CO	73S	EWR-ORY	CO	D10	ORY-LYS	IT	320	17:05
40	34	IND-JFK	DL	M88	JFK-CDG	AF	343	CDG-LYS	AF	CRJ	17:10
40	41	IND-CVG	DL	M88	CVG-ORY	DL	L15	CDG-LYS	AF	CRJ	17:10
40	52	IND-JFK	DL	M88	JFK-ORY	PK	74M	CDG-LYS	AF	CRJ	17:10
43	59	IND-EWR	**US**	SF3	EWR-FRA	LH	340	FRA-LYS	LH	737	17:20
44	45	IND-YYZ	**US**	SF3	YYZ-FRA	LH	747	FRA-LYS	LH	737	17:25
44	56	IND-ORD	**AA**	AT7	ORD-LHR	AA	M11	LHR-LYS	AF	737	17:25
46	39	IND-EWR	CO	73S	EWR-FRA	LH	737	FRA-LYS	LH	737	17:30
46	58	IND-ORD	UA	733	ORD-LHR	AA	M11	LHR-LYS	AF	737	17:30
48	60	IND-ORD	**AA**	AT7	ORD-LHR	BA	747	LHR-LYS	BA	737	17:45
49	62	IND-ORD	UA	733	ORD-LHR	BA	747	LHR-LYS	BA	737	17:50
50	49	IND-ORD	**AA**	AT7	ORD-BRU	AA	763	BRU-LYS	SN	F28	17:55
51	40	IND-YYZ	**AC**	DH1	YYZ-LHR	BA	741	LHR-LYS	AF	737	18:10
52	57	IND-ORD	**AA**	AT7	ORD-LHR	AA	M11	LHR-LYS	AF	737	18:25
53	42	IND-DTW	NW	D9S	DTW-AMS	KL	D10	AMS-LYS	KL	100	18:30
53	43	IND-DTW	KL	D9S	DTW-AMS	KL	D10	AMS-LYS	KL	100	18:30
53	44	IND-DTW	NW	D9S	DTW-AMS	NW	D10	AMS-LYS	KL	100	18:30
54	63	IND-YYZ	**US**	SF3	YYZ-LHR	BA	741	LHR-LYS	AF	737	18:45
55	64	IND-ORD	**AA**	AT7	ORD-ORY	AA	763	ORY-LYS	IT	320	18:50
55	98	IND-LGA	US	100	JFK-CDG	AF	SSC	ORY-LYS	IT	320	18:50
57	31	IND-CVG	DL	CRJ	CVG-ORY	DL	L15	ORY-LYS	IT	320	18:58
58	86	IND-LGA	US	100	JFK-LHR	BA	SSC	LHR-LYS	BA	320	19:00
58	91	IND-LGA	US	73S	JFK-LHR	BA	SSC	LHR-LYS	BA	737	19:00
60	94	IND-EWR	CO	73S	JFK-LHR	BA	SSC	LHR-LYS	BA	320	19:20
61	54	IND-CVG	DL	CRJ	CVG-ORY	DL	L15	CDG-LYS	AF	CRJ	19:23
62	68	IND-ORD	UA	320	ORD-ORY	AA	763	ORY-LYS	IT	320	19:30
63	76	IND-DTW	KL	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	19:40

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
63	77	IND-DTW	**NW**	D9S	DTW-AMS	**NW**	74M	AMS-LYS	KL	100	19:40
63	85	IND-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	19:40
64	65	IND-DTW	NW	D9S	DTW-AMS	**KL**	D10	AMS-LYS	KL	100	19:50
64	66	IND-DTW	NW	D9S	DTW-AMS	NW	D10	AMS-LYS	KL	100	19:50
65	70	IND-DTW	**US**	SF3	DTW-AMS	KL	74M	AMS-LYS	KL	100	20:15
65	75	IND-DTW	**US**	SF3	DTW-AMS	**NW**	74M	AMS-LYS	KL	100	20:15
66	97	IND-LGA	US	100	EWR-ORY	AF	747	ORY-LYS	IT	320	20:20
67	90	IND-YYZ	**US**	SF3	YYZ-FRA	LH	747	FRA-LYS	LH	737	20:25
68	87	IND-ORD	**AA**	AT7	ORD-ORY	AA	763	ORY-LYS	IT	320	20:30
69	88	IND-EWR	CO	73S	EWR-ORY	CO	D10	ORY-LYS	IT	320	20:40
69	89	IND-EWR	CO	73S	EWR-ORY	AF	747	ORY-LYS	IT	320	20:40
71	67	IND-CVG	DL	72S	CVG-ORY	DL	L15	ORY-LYS	IT	320	21:00
72	106	IND-YYZ	**US**	SF3	YYZ-FRA	LH	747	FRA-LYS	LH	737	21:20
73	69	IND-CVG	DL	72S	CVG-ORY	DL	L15	CDG-LYS	AF	CRJ	21:25
73	79	IND-DTW	NW	72S	DTW-AMS	KL	74M	AMS-LYS	KL	100	21:25
73	80	IND-DTW	NW	72S	DTW-AMS	**NW**	74M	AMS-LYS	KL	100	21:25
73	82	IND-DTW	**KL**	72S	DTW-AMS	KL	74M	AMS-LYS	KL	100	21:25
75	101	IND-ORD	UA	73S	ORD-ORY	AA	763	ORY-LYS	IT	320	21:30
76	92	IND-DTW	NW	D9S	DTW-AMS	NW	D10	AMS-LYS	KL	100	21:40
76	93	IND-DTW	NW	D9S	DTW-AMS	**KL**	D10	AMS-LYS	KL	100	21:40
77	100	IND-YYZ	**US**	SF3	YYZ-LHR	BA	741	LHR-LYS	AF	737	21:45
77	102	IND-YYZ	**AC**	DH1	YYZ-FRA	LH	747	FRA-LYS	LH	737	21:45
79	103	IND-BOS	US	100	BOS-LGW	NW	D10	LGW-LYS	**BA**	F28	21:50
79	104	IND-BOS	US	100	BOS-LGW	VS	747	LGW-LYS	**BA**	F28	21:50
79	105	IND-BOS	US	100	BOS-LGW	**DL**	747	LGW-LYS	**BA**	F28	21:50
81	95	IND-DTW	**US**	SWM	DTW-AMS	**KL**	D10	AMS-LYS	KL	100	21:55
81	96	IND-DTW	**US**	SWM	DTW-AMS	NW	D10	AMS-LYS	KL	100	21:55
82	81	IND-DTW	**US**	SWM	DTW-AMS	KL	74M	AMS-LYS	KL	100	22:15
82	83	IND-DTW	**US**	SWM	DTW-AMS	**NW**	74M	AMS-LYS	KL	100	22:15
83	111	IND-YYZ	**US**	SF3	YYZ-LHR	BA	741	LHR-LYS	AF	737	22:40
84	114	IND-BOS	NW	72S	BOS-LGW	NW	D10	LGW-LYS	**BA**	F28	22:45
84	115	IND-BOS	NW	72S	BOS-LGW	VS	747	LGW-LYS	**BA**	F28	22:45
84	116	IND-BOS	NW	72S	BOS-LGW	**DL**	747	LGW-LYS	**BA**	F28	22:45
86	71	IND-DTW	**KL**	72S	DTW-AMS	KL	74M	AMS-LYS	KL	100	23:05
86	73	IND-DTW	NW	72S	DTW-AMS	KL	74M	AMS-LYS	KL	100	23:05
86	78	IND-DTW	NW	72S	DTW-AMS	**NW**	74M	AMS-LYS	KL	100	23:05
86	107	IND-DTW	NW	72S	DTW-AMS	NW	D10	AMS-LYS	KL	100	23:05
86	108	IND-DTW	NW	72S	DTW-AMS	**KL**	D10	AMS-LYS	KL	100	23:05
86	110	IND-YYZ	**AC**	DH1	YYZ-LHR	BA	741	LHR-LYS	AF	737	23:05
89	99	IND-CVG	**DL**	EM2	CVG-ORY	DL	L15	ORY-LYS	IT	L15	23:10
90	109	IND-CVG	**DL**	EM2	CVG-ORY	DL	L15	CDG-LYS	AF	CRJ	23:35
91	74	IND-DTW	**US**	SWM	DTW-AMS	KL	74M	AMS-LYS	KL	100	25:20
91	72	IND-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	25:20
91	84	IND-DTW	**KL**	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	25:20
93	112	IND-DTW	**KL**	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	28:10
93	113	IND-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	28:10
94	117	IND-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	29:30
95	122	IND-LGA	US	73S	JFK-LHR	UA	763	LHR-LYS	BA	320	30:45
95	123	IND-LGA	US	73S	JFK-LHR	BA	741	LHR-LYS	BA	320	30:45
97	118	IND-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-LYS	KL	100	31:20
98	119	IND-DTW	**US**	SWM	DTW-AMS	KL	74M	AMS-LYS	KL	100	31:35
99	121	IND-BOS	US	733	BOS-LHR	AA	767	LHR-LYS	BA	320	32:05
100	120	IND-YYZ	**US**	SF3	YYZ-LHR	AC	767	LHR-LYS	BA	320	32:21

CRS ranking: with duplications

Elapsed ranking: ranking based on total elapsed time, with duplications counted only once

Bold type: flight operated by another carrier

: end-to-end codesharing routing

From SABRE listing for travel on Wednesday, 18 October 1995

Table A4-2. NASHVILLE — LONDON

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
1	13	BNA-LGA	AA	100	JFK-LHR	BA	SSC				07:50
2	72	BNA-GSO	**CO**	BE1	GSO-LGA	CO	D9S	JFK-LHR	BA	SSC	09:25
3	9	BNA-EWR	CO	735	EWR-LHR	CO	D10				09:45
4	10	BNA-CVG	DL	73S	CVG-LGW	DL	L15				09:50
5	3	BNA-ATL	DL	M88	ATL-LGW	DL	M11				10:05
6	17	BNA-STL	TW	DC9	STL-LGW	TW	767				10:09
7	16	BNA-DTW	NW	72S	DTW-LGW	NW	D10				10:15
8	7	BNA-PHL	**BA**	EQV	PHL-LHR	BA	741				10:20
8	8	BNA-PHL	US	100	PHL-LHR	BA	741				10:20
9	11	BNA-ATL	DL	757	ATL-LGW	DL	L15				10:25
9	84	BNA-CVG	**DL**	CRJ	CVG-LGA	DL	M88	JFK-LHR	BA	SSC	10:25
11	28	BNA-CLT	US	DC9	CLT-IAD	US	73S	IAD-LHR	UA	777	10:30
12	18	BNA-ORD	AA	100	ORD-LHR	AA	M11				10:43
13	2	BNA-ORD	AA	S80	ORD-LHR	AA	M11				10:44
14	27	BNA-CLT	US	DC9	CLT-IAD	US	73S	IAD-LHR	BA	747	10:45
14	65	BNA-ATL	DL	M88	ATL-JFK	TW	D9S	JFK-LHR	BA	SSC	10:45
14	89	BNA-ATL	DL	M88	ATL-LGA	DL	763	JFK-LHR	BA	SSC	10:45
17	33	BNA-CLT	US	D9S	CLT-IAD	US	73S	IAD-LHR	UA	741	11:00
18	1	BNA-PIT	US	100	PIT-LGW	BA	767				11:08
19	5	BNA-LGA	AA	S80	JFK-LHR	AA	767				11:10
19	6	BNA-LGA	AA	S80	JFK-LGW	BA	D10				11:10
19	42	BNA-CVG	DL	73S	CVG-EWR	DL	M88	EWR-LHR	**DL**	744	11:10
19	45	BNA-CVG	DL	73S	CVG-EWR	DL	M88	EWR-LHR	VS	744	11:10
22	4	BNA-LGA	AA	S80	JFK-LHR	UA	763				11:15
23	12	BNA-LGA	AA	S80	JFK-LHR	AA	767				11:20
24	29	BNA-PIT	US	100	PIT-IAD	US	DC9	IAD-LHR	UA	777	11:23
25	14	BNA-EWR	CO	735	EWR-LHR	**DL**	744				11:30
25	15	BNA-EWR	CO	735	EWR-LHR	VS	744				11:30
25	31	BNA-CVG	**DL**	SF3	CVG-EWR	**DL**	CRJ	EWR-LHR	UA	777	11:30
27	30	BNA-PIT	US	100	PIT-BWI	US	757	BWI-LGW	BA	767	11:33
28	32	BNA-CVG	**DL**	SF3	CVG-EWR	**DL**	CRJ	EWR-LHR	BA	741	11:35
29	34	BNA-CVG	**DL**	SF3	CVG-EWR	**DL**	CRJ	EWR-LGW	CO	D10	12:00
29	36	BNA-CVG	**DL**	CRJ	CVG-JFK	DL	72S	JFK-LHR	AA	767	12:00
31	37	BNA-CVG	**DL**	CRJ	CVG-JFK	DL	72S	JFK-LHR	UA	763	12:05
32	41	BNA-STL	TW	D9S	STL-ORD	TW	72S	ORD-LHR	BA	741	12:10
32	49	BNA-CVG	DL	73S	CVG-JFK	DL	72S	JFK-LHR	BA	744	12:10
34	39	BNA-STL	TW	D9S	STL-ORD	TW	72S	ORD-LHR	AA	M11	12:12
35	56	BNA-ATL	DL	757	ATL-MAN	DL	L15	MAN-LHR	BA	757	12:15
36	35	BNA-ATL	DL	72S	ATL-JFK	DL	763	JFK-LHR	**DL**	340	12:25
37	40	BNA-CVG	**DL**	CRJ	CVG-EWR	**DL**	CRJ	EWR-LHR	UA	777	12:30
38	38	BNA-ATL	DL	72S	ATL-EWR	CO	M80	EWR-LGW	CO	D10	12:35
38	50	BNA-EWR	CO	735	EWR-MAN	CO	757	MAN-LGW	BA	737	12:35
38	59	BNA-ATL	DL	757	ATL-MAN	DL	L15	MAN-STN	**BA**	J41	12:35
41	43	BNA-ATL	DL	M88	ATL-EWR	CO	M80	EWR-LHR	**DL**	744	12:50
41	44	BNA-ATL	DL	M88	ATL-EWR	DL	763	EWR-LHR	**DL**	744	12:50
41	46	BNA-ATL	DL	M88	ATL-EWR	DL	763	EWR-LHR	VS	744	12:50
43	19	BNA-EWR	CO	737	JFK-LHR	AA	767				13:20
44	48	BNA-LGA	AA	S80	JFK-MAN	BA	767	MAN-LHR	BA	757	13:25
44	51	BNA-PIT	US	734	PIT-IAD	US	D9S	IAD-LHR	UA	777	13:25
44	52	BNA-PIT	US	734	PIT-IAD	**UA**	J41	IAD-LHR	UA	777	13:25
47	55	BNA-ATL	**AA**	J32	ATL-MAN	DL	L15	MAN-LHR	BA	757	13:30
47	74	BNA-GSO	**CO**	BE1	GSO-LGA	US	737	JFK-LHR	BA	763	13:30
49	53	BNA-STL	TW	D9S	STL-ORD	TW	M83	ORD-LHR	AA	M11	13:35
49	54	BNA-STL	TW	D9S	STL-ORD	AA	100	ORD-LHR	AA	M11	13:35
49	57	BNA-PIT	US	734	PIT-BWI	US	757	BWI-LGW	BA	767	13:35
49	75	BNA-GSO	**CO**	BE1	GSO-LGA	US	737	JFK-LHR	AA	767	13:35
53	61	BNA-ATL	DL	M88	ATL-JFK	TW	M80	JFK-LHR	AA	767	13:40
53	71	BNA-ATL	DL	757	ATL-MAN	DL	L15	MAN-LGW	BA	737	13:40
55	20	BNA-BOS	AA	S80	BOS-LHR	BA	767				13:44
56	62	BNA-ATL	DL	M88	ATL-JFK	TW	M80	JFK-LHR	UA	763	13:45
57	60	BNA-ATL	**AA**	J32	ATL-MAN	DL	L15	MAN-STN	**BA**	J41	13:50
58	67	BNA-CLE	CO	735	CLE-JFK	TW	D9S	JFK-LHR	AA	767	14:05
58	68	BNA-CLE	CO	735	CLE-JFK	**DL**	SF3	JFK-LHR	AA	767	14:05
58	69	BNA-CLE	CO	735	CLE-JFK	**AA**	ATR	JFK-LHR	AA	767	14:05
61	80	BNA-CLE	DL	M88	CLE-EWR	CO	733	EWR-LHR	UA	777	14:10
62	47	BNA-ATL	DL	72S	ATL-EWR	DL	763	EWR-LHR	VS	744	14:20

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
62	76	BNA-ORD	**AC**	737	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	14:20
62	77	BNA-ORD	UA	737	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	14:20
62	78	BNA-ORD	UA	737	ORD-YYZ	AA	757	YYZ-LHR	CP	D10	14:20
62	79	BNA-ORD	UA	737	ORD-YYZ	**CP**	757	YYZ-LHR	CP	D10	14:20
64	63	BNA-GSO	**CO**	BE1	GSO-EWR	CO	73S	EWR-LGW	CO	D10	14:25
65	66	BNA-ATL	DL	M88	ATL-JFK	DL	763	JFK-LHR	**DL**	340	14:30
66	82	BNA-CVG	DL	73S	CVG-JFK	DL	72S	JFK-LHR	AA	767	14:35
67	85	BNA-CLE	DL	M88	CLE-EWR	CO	M80	EWR-LHR	CO	D10	14:40
67	83	BNA-CVG	DL	73S	CVG-JFK	DL	72S	JFK-LHR	UA	763	14:40
69	86	BNA-ORD	AA	S80	ORD-YYZ	**CP**	757	YYZ-LHR	CP	D10	14:44
69	87	BNA-ORD	AA	S80	ORD-YYZ	AA	757	YYZ-LHR	CP	D10	14:44
69	88	BNA-ORD	**AA**	S80	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	14:44
71	58	BNA-STL	TW	D9S	STL-ORD	TW	72S	ORD-LHR	BA	741	14:47
72	81	BNA-ORD	**AC**	737	ORD-YYZ	AC	D9S	YYZ-LHR	AC	74M	14:50
73	70	BNA-ATL	**AA**	J32	ATL-MAN	DL	L15	MAN-LGW	BA	737	14:55
73	90	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	UA	777	14:55
75	92	BNA-ATL	**AA**	J32	ATL-JFK	TW	M80	JFK-LHR	AA	767	15:00
75	64	BNA-LGA	AA	S80	EWR-MAN	CO	757	MAN-LGW	BA	737	15:00
77	24	BNA-FRA	AA	CHG	FRA-STN	UK	100				15:04
78	94	BNA-STL	TW	D9S	STL-ORD	AA	72S	ORD-LHR	AA	M11	15:05
78	95	BNA-STL	TW	D9S	STL-ORD	TW	72S	ORD-LHR	AA	M11	15:05
78	96	BNA-ATL	**AA**	J32	ATL-JFK	TW	M80	JFK-LHR	UA	763	15:05
78	97	BNA-STL	TW	D9S	STL-ORD	UA	73S	ORD-LHR	AA	M11	15:05
82	99	BNA-ATL	DL	757	ATL-JFK	TW	M80	JFK-LHR	AA	767	15:10
82	91	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	BA	747	15:10
82	105	BNA-CVG	**DL**	EM2	CVG-BOS	DL	72S	BOS-LHR	BA	767	15:10
85	100	BNA-ATL	DL	757	ATL-JFK	TW	M80	JFK-LHR	UA	763	15:15
86	98	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	UA	777	15:25
87	101	BNA-EWR	CO	737	JFK-MAN	BA	767	MAN-LHR	BA	757	15:35
88	103	BNA-ATL	**AA**	J32	ATL-JFK	DL	763	JFK-LHR	**DL**	340	15:50
88	131	BNA-CVG	**DL**	CRJ	CVG-LGA	DL	M88	JFK-LHR	BA	SSC	15:50
88	133	BNA-CVG	**DL**	CRJ	CVG-EWR	**DL**	CRJ	JFK-LHR	BA	SSC	15:50
91	104	BNA-ATL	DL	757	ATL-JFK	DL	763	JFK-LHR	**DL**	340	16:00
92	106	BNA-CLE	DL	M88	CLE-LGA	CO	733	JFK-LHR	BA	741	16:05
93	73	BNA-STL	TW	D9S	STL-ORD	AA	100	ORD-LHR	AA	M11	16:12
94	21	BNA-LGA	AA	100	JFK-LHR	BA	SSC				16:13
95	107	BNA-PIT	US	D9S	PIT-IAD	US	D9S	IAD-LHR	UA	777	16:15
95	108	BNA-PIT	US	D9S	PIT-IAD	**UA**	J41	IAD-LHR	UA	777	16:15
97	110	BNA-ORD	**AA**	S80	ORD-YYZ	**CP**	757	YYZ-LHR	CP	D10	16:22
97	111	BNA-ORD	**AA**	S80	ORD-YYZ	AA	757	YYZ-LHR	CP	D10	16:22
97	112	BNA-ORD	AA	S80	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	16:22
99	93	BNA-EWR	NW	D9S	EWR-MAN	CO	757	MAN-LGW	BA	737	16:25
99	109	BNA-PIT	US	D9S	PIT-BWI	US	757	BWI-LGW	BA	767	16:25
101	113	BNA-CVG	**DL**	EM2	CVG-JFK	DL	72S	JFK-LHR	AA	767	16:35
102	114	BNA-CVG	**DL**	EM2	CVG-JFK	DL	72S	JFK-LHR	UA	763	16:40
103	130	BNA-CVG	**DL**	CRJ	CVG-BOS	DL	72S	BOS-LHR	BA	767	16:55
104	102	BNA-EWR	CO	737	EWR-MAN	CO	757	MAN-LGW	BA	737	17:10
105	118	BNA-ATL	DL	72S	ATL-JFK	TW	M80	JFK-LHR	AA	767	17:20
105	119	BNA-ORD	UA	73S	ORD-YYZ	AA	757	YYZ-LHR	CP	D10	17:20
105	120	BNA-ORD	UA	73S	ORD-YYZ	**CP**	757	YYZ-LHR	CP	D10	17:20
105	121	BNA-ORD	UA	73S	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	17:20
108	122	BNA-STL	TW	DC9	STL-ORD	AA	72S	ORD-LHR	AA	M11	17:25
108	123	BNA-STL	TW	DC9	STL-ORD	TW	72S	ORD-LHR	AA	M11	17:25
108	124	BNA-ATL	DL	72S	ATL-JFK	TW	M80	JFK-LHR	UA	763	17:25
108	125	BNA-STL	TW	DC9	STL-ORD	UA	73S	ORD-LHR	AA	M11	17:25
108	143	BNA-GSO	**CO**	BE1	GSO-LGA	US	737	JFK-LHR	UA	763	17:25
113	126	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	UA	777	17:30
114	135	BNA-ORD	AA	100	ORD-YYZ	**CP**	757	YYZ-LHR	CP	D10	17:38
114	136	BNA-ORD	AA	100	ORD-YYZ	AA	757	YYZ-LHR	CP	D10	17:38
114	137	BNA-ORD	AA	100	ORD-YYZ	AC	D9S	YYZ-LHR	CP	D10	17:38
116	127	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	BA	747	17:45
117	151	BNA-ATL	DL	M88	ATL-EWR	DL	767	JFK-LHR	AA	M11	17:55
118	128	BNA-LGA	AA	100	JFK-MAN	BA	767	MAN-LHR	BA	757	18:00
118	138	BNA-CLT	US	100	CLT-IAD	US	73S	IAD-LHR	UA	741	18:00
120	139	BNA-ATL	DL	72S	ATL-JFK	DL	763	JFK-LHR	**DL**	340	18:10
120	140	BNA-ATL	DL	72S	ATL-JFK	DL	763	JFK-LHR	VS	340	18:10
121	115	BNA-BOS	AA	S80	BOS-SNN	EI	330	SNN-LHR	EI	734	18:14
122	147	BNA-CVG	**DL**	CRJ	CVG-JFK	DL	72S	JFK-LHR	AA	767	18:20

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
122	141	BNA-GSO	**CO**	BE1	GSO-EWR	CO	73S	EWR-LGW	CO	D10	18:20
124	152	BNA-ATL	**AA**	J32	ATL-EWR	DL	767	JFK-LHR	AA	M11	18:25
125	116	BNA-BOS	AA	S80	BOS-SNN	EI	330	SNN-LGW	7L	B11	18:29
126	145	BNA-CVG	**DL**	CRJ	CVG-BOS	DL	763	BOS-LHR	AA	767	18:40
126	149	BNA-ATL	DL	M88	ATL-JFK	TW	M80	JFK-LHR	AA	767	18:40
126	155	BNA-CLE	DL	M88	CLE-JFK	**AA**	ATR	JFK-LHR	AA	767	18:40
126	156	BNA-CLE	DL	M88	CLE-JFK	TW	D9S	JFK-LHR	AA	767	18:40
126	157	BNA-CLE	DL	M88	CLE-JFK	**DL**	J32	JFK-LHR	AA	767	18:40
131	23	BNA-LGA	AA	100	JFK-LHR	AA	M11				18:43
132	117	BNA-CLE	CO	737	CLE-JFK	**AA**	ATR	JFK-LHR	BA	SSC	19:10
132	129	BNA-GSO	**CO**	BE1	GSO-LGA	CO	73S	JFK-LHR	BA	SSC	19:10
132	132	BNA-CLE	CO	737	CLE-EWR	CO	737	JFK-LHR	BA	SSC	19:10
132	134	BNA-GSO	**CO**	BE1	GSO-EWR	CO	733	JFK-LHR	BA	SSC	19:10
136	22	BNA-BOS	AA	S80	BOS-LHR	AA	767				19:30
137	148	BNA-LGA	AA	100	EWR-MAN	CO	757	MAN-LGW	BA	737	19:35
138	154	BNA-ATL	DL	72S	ATL-EWR	DL	767	JFK-LHR	AA	M11	19:45
139	25	BNA-FRA	DL	CHG	FRA-LCY	**LH**	146				19:55
140	142	BNA-CVG	**DL**	CRJ	CVG-LGA	DL	M88	JFK-LHR	BA	SSC	20:20
140	144	BNA-CVG	**DL**	CRJ	CVG-EWR	**DL**	CRJ	JFK-LHR	BA	SSC	20:20
142	159	BNA-ATL	DL	M88	ATL-JFK	TW	D9S	JFK-LHR	BA	SSC	20:25
142	162	BNA-ATL	DL	M88	ATL-LGA	DL	763	JFK-LHR	BA	SSC	20:25
144	146	BNA-BOS	AA	S80	BOS-DUB	EI	330	DUB-LHR	EI	734	20:29
145	158	BNA-ATL	**AA**	J32	ATL-JFK	TW	D9S	JFK-LHR	BA	SSC	20:55
145	161	BNA-ATL	**AA**	J32	ATL-LGA	DL	763	JFK-LHR	BA	SSC	20:55
147	153	BNA-GSO	**CO**	BE1	GSO-EWR	CO	733	JFK-LHR	AA	M11	21:40
148	160	BNA-ATL	DL	72S	ATL-JFK	TW	D9S	JFK-LHR	BA	SSC	22:15
148	163	BNA-ATL	DL	72S	ATL-EWR	CO	M80	JFK-LHR	BA	SSC	22:15
150	26	BNA-FRA	DL	CHG	FRA-STN	UK	100				22:30
151	150	BNA-CVG	**DL**	CRJ	CVG-BOS	DL	763	BOS-LHR	AA	767	23:10

CRS ranking: with duplications

Elapsed ranking: ranking based on total elapsed time, with duplications counted only once

Bold type: flight operated by another carrier

▒▒▒▒▒▒ : end-to-end codesharing routing

From SABRE listing for travel on Wednesday, 20 March 1996

Table A4-3. KANSAS CITY — MUNICH

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
1	2	MCI-ORD	LH	737	ORD-MUC	LH	340				10:55
1	3	MCI-ORD	UA	737	ORD-MUC	UA	340				10:55
1	4	MCI-ORD	UA	737	ORD-MUC	LH	340				10:55
2	1	MCI-ATL	DL	72S	ATL-MUC	DL	763				12:05
3	13	MCI-ORD	UA	73S	ORD-FRA	LH	74M	FRA-MUC	LH	310	12:20
3	14	MCI-ORD	UA	73S	ORD-FRA	UA	74M	FRA-MUC	LH	310	12:20
3	15	MCI-ORD	UA	73S	ORD-FRA	UA	74M	FRA-MUC	UA	310	12:20
3	16	MCI-ORD	LH	73S	ORD-FRA	LH	74M	FRA-MUC	LH	310	12:20
4	10	MCI-ORD	AA	72S	ORD-BRU	SN	D10	BRU-MUC	SN	737	12:27
4	11	MCI-ORD	AA	72S	ORD-BRU	DL	D10	BRU-MUC	SN	737	12:27
4	12	MCI-ORD	AA	72S	ORD-BRU	DL	D10	BRU-MUC	DL	737	12:27
5	20	MCI-CVG	DL	73S	CVG-LGW	DL	L15	LGW-MUC	BA	737	12:50
6	7	MCI-CVG	DL	M88	CVG-MUC	DL	CHG				13:20
7	36	MCI-MSP	NW	DC9	MSP-AMS	KL	747	AMS-MUC	KL	737	13:35
7	37	MCI-MSP	NW	DC9	MSP-AMS	NW	747	AMS-MUC	KL	737	13:35
7	38	MCI-MSP	NW	DC9	MSP-AMS	NW	747	AMS-MUC	NW	737	13:35
7	39	MCI-MSP	KL	DC9	MSP-AMS	KL	747	AMS-MUC	KL	737	13:35
8	9	MCI-DTW	NW	D9S	DTW-FRA	NW	D10	FRA-MUC	LH	310	13:50
9	5	MCI-EWR	CO	735	JFK-MUC	DL	763				13:55
9	8	MCI-JFK	TW	CHG	JFK-MUC	DL	763				13:55
11	17	MCI-DTW	KL	D9S	DTW-AMS	KL	M11	AMS-MUC	KL	737	14:15
11	18	MCI-DTW	NW	D9S	DTW-AMS	KL	M11	AMS-MUC	KL	737	14:15
11	19	MCI-DTW	NW	D9S	DTW-AMS	NW	M11	AMS-MUC	NW	737	14:15
12	21	MCI-LGA	US	733	JFK-LHR	AA	767	LHR-MUC	BA	757	14:30
13	22	MCI-ORD	UA	73A	ORD-BRU	DL	D10	BRU-MUC	SN	737	14:51
13	23	MCI-ORD	UA	73A	ORD-BRU	DL	D10	BRU-MUC	DL	737	14:51
13	24	MCI-ORD	UA	73A	ORD-BRU	SN	D10	BRU-MUC	SN	737	14:51
15	26	MCI-EWR	CO	735	EWR-FRA	LH	340	FRA-MUC	LH	321	14:55
15	27	MCI-EWR	CO	735	EWR-FRA	UA	340	FRA-MUC	LH	321	14:55
15	28	MCI-EWR	CO	735	EWR-FRA	UA	340	FRA-MUC	UA	321	14:55
16	66	MCI-STL	TW	D9S	STL-LGW	TW	767	LHR-MUC	LH	320	15:05
17	25	MCI-EWR	TW	CHG	EWR-FRA	CO	D10	FRA-MUC	LH	737	15:15
18	45	MCI-MSP	NW	M80	MSP-AMS	NW	747	AMS-MUC	NW	737	15:20
18	57	MCI-MSP	KL	M80	MSP-AMS	KL	747	AMS-MUC	KL	737	15:20
18	58	MCI-MSP	NW	M80	MSP-AMS	KL	747	AMS-MUC	KL	737	15:20
18	59	MCI-MSP	NW	M80	MSP-AMS	NW	747	AMS-MUC	KL	737	15:20
19	31	MCI-ORD	AA	100	ORD-BRU	DL	D10	BRU-MUC	SN	737	15:28
19	32	MCI-ORD	AA	100	ORD-BRU	DL	D10	BRU-MUC	DL	737	15:28
19	33	MCI-ORD	AA	100	ORD-BRU	SN	D10	BRU-MUC	SN	737	15:28
20	29	MCI-LGA	US	733	JFK-FRA	TW	767	FRA-MUC	LH	737	15:45
20	30	MCI-LGA	US	733	JFK-FRA	DL	763	FRA-MUC	LH	737	15:45
22	65	MCI-STL	TW	72S	STL-LGW	TW	767	LHR-MUC	LH	320	16:05
22	34	MCI-ORD	LH	737	ORD-FRA	LH	777	FRA-MUC	LH	320	16:05
22	46	MCI-DTW	NW	D9S	DTW-AMS	KL	74M	AMS-MUC	KL	737	16:05
22	48	MCI-DTW	NW	D9S	DTW-AMS	NW	74M	AMS-MUC	NW	737	16:05
22	52	MCI-DTW	NW	D9S	DTW-AMS	NW	74M	AMS-MUC	KL	737	16:05
22	60	MCI-DTW	KL	D9S	DTW-AMS	KL	74M	AMS-MUC	KL	737	16:05
25	40	MCI-JFK	TW	CHG	JFK-FRA	UA	343	FRA-MUC	LH	310	16:10
25	41	MCI-JFK	TW	CHG	JFK-FRA	UA	343	FRA-MUC	UA	310	16:10
25	42	MCI-JFK	TW	CHG	JFK-FRA	LH	343	FRA-MUC	LH	310	16:10
26	35	MCI-CVG	DL	M88	CVG-LGW	DL	L15	LGW-MUC	BA	737	16:45
27	6	MCI-LGA	US	733	JFK-MUC	DL	763				16:55
28	47	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	NW	737	17:00
28	54	MCI-MSP	NW	D9S	MSP-AMS	KL	747	AMS-MUC	KL	737	17:00
28	55	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	KL	737	17:00
28	61	MCI-MSP	KL	D9S	MSP-AMS	KL	747	AMS-MUC	KL	737	17:00
29	64	MCI-STL	TW	72S	STL-LGW	TW	767	LHR-MUC	LH	320	17:05
30	62	MCI-DTW	NW	D9S	DTW-FRA	NW	D10	FRA-MUC	LH	310	17:15
31	67	MCI-DTW	KL	DC9	DTW-AMS	KL	M11	AMS-MUC	KL	737	17:40
31	68	MCI-DTW	NW	DC9	DTW-AMS	KL	M11	AMS-MUC	KL	737	17:40
31	69	MCI-DTW	NW	DC9	DTW-AMS	NW	M11	AMS-MUC	NW	737	17:40
32	44	MCI-ORD	LH	737	ORD-FRA	LH	777	FRA-MUC	LH	737	17:45
32	71	MCI-ORD	UA	72A	ORD-BRU	DL	D10	BRU-MUC	SN	737	17:45
32	72	MCI-ORD	UA	72A	ORD-BRU	DL	D10	BRU-MUC	DL	737	17:45
32	73	MCI-ORD	UA	72A	ORD-BRU	SN	D10	BRU-MUC	SN	737	17:45
34	43	MCI-STL	TW	M80	STL-CDG	TW	767	CDG-MUC	LH	737	17:50
35	88	MCI-LGA	US	733	EWR-FRA	LH	340	FRA-MUC	LH	321	17:55
35	89	MCI-LGA	US	733	EWR-FRA	UA	340	FRA-MUC	LH	321	17:55
35	90	MCI-LGA	US	733	EWR-FRA	UA	340	FRA-MUC	UA	321	17:55
36	79	MCI-EWR	CO	735	EWR-FRA	LH	340	FRA-MUC	LH	321	18:15
36	80	MCI-EWR	CO	735	EWR-FRA	UA	340	FRA-MUC	LH	321	18:15
36	81	MCI-EWR	CO	735	EWR-FRA	UA	340	FRA-MUC	UA	321	18:15
37	50	MCI-MSP	NW	D9S	MSP-AMS	KL	747	AMS-MUC	KL	737	18:20
37	51	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	NW	737	18:20

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
37	53	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	KL	737	18:20
37	56	MCI-MSP	**KL**	D9S	MSP-AMS	**KL**	747	AMS-MUC	KL	737	18:20
38	76	MCI-ORD	AA	S80	ORD-BRU	**DL**	D10	BRU-MUC	SN	737	18:27
38	77	MCI-ORD	AA	S80	ORD-BRU	**DL**	D10	BRU-MUC	**DL**	737	18:27
38	78	MCI-ORD	AA	S80	ORD-BRU	SN	D10	BRU-MUC	SN	737	18:27
39	63	MCI-STL	TW	M80	STL-LGW	TW	767	LHR-MUC	LH	320	18:35
40	49	MCI-DTW	**KL**	D9S	DTW-AMS	KL	74M	AMS-MUC	KL	737	19:20
40	70	MCI-STL	TW	D9S	STL-CDG	TW	767	CDG-MUC	LH	737	19:20
42	108	MCI-EWR	AA	100	EWR-FRA	LH	340	FRA-MUC	LH	321	19:27
42	109	MCI-EWR	AA	100	EWR-FRA	**UA**	340	FRA-MUC	LH	321	19:27
42	110	MCI-EWR	AA	100	EWR-FRA	**UA**	340	FRA-MUC	**UA**	321	19:27
43	91	MCI-DTW	NW	D9S	DTW-FRA	NW	D10	FRA-MUC	LH	310	20:00
44	96	MCI-ORD	AA	100	ORD-BRU	**DL**	D10	BRU-MUC	SN	737	20:02
44	97	MCI-ORD	AA	100	ORD-BRU	**DL**	D10	BRU-MUC	**DL**	737	20:02
44	98	MCI-ORD	AA	100	ORD-BRU	SN	D10	BRU-MUC	SN	737	20:02
45	74	MCI-STL	TW	D9S	STL-LGW	TW	767	LHR-MUC	LH	320	20:05
46	106	MCI-STL	TW	D9S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	20:10
47	75	MCI-STL	TW	72S	STL-CDG	TW	767	CDG-MUC	LH	737	20:20
48	94	MCI-DTW	**KL**	D9S	DTW-AMS	KL	M11	AMS-MUC	KL	737	20:25
48	95	MCI-DTW	NW	D9S	DTW-AMS	**NW**	M11	AMS-MUC	**NW**	737	20:25
49	116	MCI-ORD	UA	73A	ORD-BRU	**DL**	D10	BRU-MUC	SN	737	20:35
49	117	MCI-ORD	UA	73A	ORD-BRU	**DL**	D10	BRU-MUC	**DL**	737	20:35
49	118	MCI-ORD	UA	73A	ORD-BRU	SN	D10	BRU-MUC	SN	737	20:35
50	93	MCI-CVG	DL	M88	CVG-LGW	DL	L15	LGW-MUC	**BA**	737	20:45
51	86	MCI-STL	TW	72S	STL-LGW	TW	767	LHR-MUC	LH	320	21:05
52	105	MCI-STL	TW	72S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	21:10
53	87	MCI-STL	TW	M83	STL-CDG	TW	767	CDG-MUC	LH	737	21:20
54	103	MCI-CVG	DL	73S	CVG-LGW	DL	L15	LCY-AGB	IQ	DH8	21:40
55	82	MCI-MSP	NW	D9S	MSP-AMS	**KL**	747	AMS-MUC	KL	737	21:45
55	83	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	KL	737	21:45
55	84	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	**NW**	737	21:45
55	85	MCI-MSP	**KL**	D9S	MSP-AMS	**KL**	747	AMS-MUC	KL	737	21:45
56	120	MCI-EWR	CO	735	JFK-LHR	BA	SSC	LHR-MUC	LH	320	21:50
57	122	MCI-EWR	CO	735	JFK-LHR	BA	SSC	LHR-MUC	BA	757	21:55
58	99	MCI-STL	TW	M83	STL-LGW	TW	767	LHR-MUC	LH	320	22:05
59	104	MCI-STL	TW	72S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	22:10
60	111	MCI-STL	TW	D9S	STL-CDG	TW	767	CDG-MUC	LH	737	22:20
61	100	MCI-MSP	TW	M83	MSP-AMS	**KL**	747	AMS-MUC	KL	737	22:40
61	101	MCI-MSP	TW	M83	MSP-AMS	NW	747	AMS-MUC	KL	737	22:40
61	102	MCI-MSP	TW	M83	MSP-AMS	NW	747	AMS-MUC	**NW**	737	22:40
62	92	MCI-DTW	**KL**	D9S	DTW-AMS	KL	74M	AMS-MUC	KL	737	22:45
63	119	MCI-LGA	US	733	JFK-LHR	BA	SSC	LHR-MUC	LH	320	22:50
64	121	MCI-LGA	US	733	JFK-LHR	BA	SSC	LHR-MUC	BA	757	22:55
65	123	MCI-STL	TW	D9S	STL-LGW	TW	767	LHR-MUC	LH	320	23:05
66	125	MCI-STL	TW	M80	STL-CDG	TW	767	CDG-MUC	LH	737	23:20
67	112	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	KL	737	23:30
67	113	MCI-MSP	NW	D9S	MSP-AMS	NW	747	AMS-MUC	**NW**	737	23:30
67	114	MCI-MSP	NW	D9S	MSP-AMS	**KL**	747	AMS-MUC	KL	737	23:30
67	115	MCI-MSP	KL	D9S	MSP-AMS	**KL**	747	AMS-MUC	KL	737	23:30
68	107	MCI-STL	TW	M80	STL-LGW	TW	767	LCY-AGB	IQ	DH8	23:40
69	127	MCI-STL	TW	M80	STL-LGW	TW	767	LHR-MUC	LH	320	24:05
70	129	MCI-STL	TW	M83	STL-CDG	TW	767	CDG-MUC	LH	737	24:20
71	130	MCI-STL	TW	M83	STL-LGW	TW	767	LHR-MUC	LH	320	25:05
72	124	MCI-STL	TW	D9S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	25:10
73	132	MCI-STL	TW	72S	STL-CDG	TW	767	CDG-MUC	LH	737	25:20
74	126	MCI-CVG	DL	M88	CVG-LGW	DL	L15	LCY-AGB	IQ	DH8	25:35
75	133	MCI-STL	TW	72S	STL-LGW	TW	767	LHR-MUC	LH	320	26:05
76	128	MCI-STL	TW	72S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	26:10
77	131	MCI-STL	TW	M83	STL-LGW	TW	767	LCY-AGB	IQ	DH8	27:10
78	134	MCI-STL	TW	D9S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	28:10
79	135	MCI-STL	TW	M80	STL-LGW	TW	767	LCY-AGB	IQ	DH8	29:10
80	136	MCI-CVG	DL	M88	CVG-LGW	DL	L15	LCY-AGB	IQ	DH8	29:35
81	137	MCI-STL	TW	M83	STL-LGW	TW	767	LCY-AGB	IQ	DH8	30:10
82	138	MCI-STL	TW	72S	STL-LGW	TW	767	LCY-AGB	IQ	DH8	31:10

CRS ranking: with duplications

Elapsed ranking: ranking based on total elapsed time, with duplications counted only once

Bold type: flight operated by another carrier

: end-to-end codesharing routing

From SABRE listing for travel on Wednesday, 20 March 1996

Table A4-4. SEATTLE — CAIRO

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
1	1	SEA-LHR	BA	741	LHR-CAI	MS	AB3				16:40
2	2	SEA-LHR	BA	741	LHR-CAI	BA	777				18:50
3	7	SEA-FRA	DL	CHG	FRA-CAI	LH	310				18:55
3	35	SEA-YVR	**AC**	DH1	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	18:55
5	18	SEA-YVR	**CP**	DH3	YVR-FRA	LH	747	FRA-CAI	LH	310	19:10
5	19	SEA-YVR	**CP**	DH3	YVR-FRA	**CP**	747	FRA-CAI	LH	310	19:10
6	34	SEA-YVR	**AS**	DH8	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	19:20
7	22	SEA-ORD	UA	733	ORD-FRA	LH	74M	FRA-CAI	LH	310	19:34
7	23	SEA-ORD	UA	733	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	19:34
7	24	SEA-ORD	UA	733	ORD-FRA	AA	763	FRA-CAI	LH	310	19:34
9	15	SEA-ORD	AA	S80	ORD-FRA	UA	777	FRA-CAI	LH	310	19:35
9	16	SEA-ORD	AA	S80	ORD-FRA	UA	777	FRA-CAI	**UA**	310	19:35
9	17	SEA-ORD	AA	S80	ORD-FRA	**LH**	777	FRA-CAI	LH	310	19:35
9	25	SEA-ORD	**LH**	757	ORD-FRA	LH	74M	FRA-CAI	LH	310	19:35
9	26	SEA-ORD	UA	757	ORD-FRA	LH	74M	FRA-CAI	LH	310	19:35
9	27	SEA-ORD	UA	757	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	19:35
9	28	SEA-ORD	UA	757	ORD-FRA	AA	763	FRA-CAI	LH	310	19:35
12	9	SEA-YVR	**AC**	DH1	YVR-FRA	LH	747	FRA-CAI	LH	310	19:50
12	10	SEA-ORD	UA	D10	ORD-FRA	LH	777	FRA-CAI	LH	310	19:50
12	11	SEA-ORD	UA	D10	ORD-FRA	UA	777	FRA-CAI	LH	310	19:50
12	12	SEA-ORD	UA	D10	ORD-FRA	UA	777	FRA-CAI	**UA**	310	19:50
12	13	SEA-ORD	**LH**	D10	ORD-FRA	**LH**	777	FRA-CAI	LH	310	19:50
12	14	SEA-YVR	**AC**	DH1	YVR-FRA	**CP**	747	FRA-CAI	LH	310	19:50
15	31	SEA-ORD	AA	S80	ORD-FRA	LH	74M	FRA-CAI	LH	310	19:52
15	32	SEA-ORD	AA	S80	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	19:52
15	33	SEA-ORD	AA	S80	ORD-FRA	AA	763	FRA-CAI	LH	310	19:52
17	36	SEA-YVR	**AC**	DH1	YVR-LHR	BA	767	LHR-CAI	BA	777	19:55
18	3	SEA-JFK	TW	767	JFK-CAI	TW	763				20:00
19	20	SEA-YVR	**AS**	DH8	YVR-FRA	LH	747	FRA-CAI	LH	310	20:27
19	21	SEA-YVR	**AS**	DH8	YVR-FRA	**CP**	747	FRA-CAI	LH	310	20:27
20	39	SEA--YVR	UA	733	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	20:33
21	38	SEA-YVR	**CP**	DH3	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	20:40
22	57	SEA-LHR	BA	741	LHR-AMS	BD	735	AMS-CAI	KL	310	20:50
22	76	SEA-LHR	BA	741	LTN-AMS	CB	D28	AMS-CAI	KL	310	20:50
24	29	SEA-YYC	**AS**	F28	YYC-FRA	CP	763	FRA-CAI	LH	310	21:00
24	30	SEA-YYC	**AS**	F28	YYC-FRA	**LH**	767	FRA-CAI	LH	310	21:00
25	45	SEA-YVR	**AC**	DH1	YVR-LHR	BA	767	LHR-CAI	BA	777	21:05
26	4	SEA-EWR	CO	757	JFK-CAI	TW	763				21:10
27	37	SEA-YVR	**AC**	DH1	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	21:20
28	60	SEA-ORD	AA	S80	ORD-FRA	LH	74M	FRA-CAI	LH	310	21:25
28	61	SEA-ORD	AA	S80	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	21:25
28	62	SEA-ORD	AA	S80	ORD-FRA	AA	763	FRA-CAI	LH	310	21:25
30	44	SEA-YVR	**AS**	DH8	YVR-LHR	BA	767	LHR-CAI	BA	777	21:30
31	63	SEA-ORD	UA	735	ORD-FRA	LH	74M	FRA-CAI	LH	310	21:35
31	64	SEA-ORD	UA	735	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	21:35
31	65	SEA-ORD	UA	735	ORD-FRA	AA	763	FRA-CAI	LH	310	21:35
33	5	SEA-LGA	NW	CHG	JFK-CAI	TW	763				21:55
33	41	SEA-YVR	UA	733	YVR-FRA	LH	747	FRA-CAI	LH	310	21:55
33	42	SEA-YVR	UA	733	YVR-FRA	**CP**	747	FRA-CAI	LH	310	21:55
33	48	SEA-ORD	UA	D10	ORD-FRA	UA	777	FRA-CAI	LH	310	21:55
33	49	SEA-ORD	UA	D10	ORD-FRA	UA	777	FRA-CAI	**UA**	310	21:55
33	50	SEA-ORD	UA	D10	ORD-FRA	**LH**	777	FRA-CAI	LH	310	21:55
36	40	SEA-YVR	**AS**	DH8	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	21:57
37	46	SEA-YVR	**AC**	DH1	YVR-FRA	LH	747	FRA-CAI	LH	310	22:15
37	47	SEA-YVR	**AC**	DH1	YVR-FRA	**CP**	747	FRA-CAI	LH	310	22:15
38	6	SEA-LGA	TW	CHG	JFK-CAI	TW	763				22:25
39	83	SEA-ORD	UA	D10	ORD-FRA	LH	74M	FRA-CAI	LH	310	22:35
39	84	SEA-ORD	UA	D10	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	22:35
39	85	SEA-ORD	UA	D10	ORD-FRA	AA	763	FRA-CAI	LH	310	22:35
41	43	SEA-YVR	UA	733	YVR-LHR	BA	767	LHR-CAI	BA	777	22:43
42	86	SEA-ORD	AA	S80	ORD-FRA	LH	74M	FRA-CAI	LH	310	22:43
42	87	SEA-ORD	AA	S80	ORD-FRA	**UA**	74M	FRA-CAI	LH	310	22:50
42	88	SEA-ORD	AA	S80	ORD-FRA	AA	763	FRA-CAI	LH	310	22:50
44	52	SEA-YVR	**CP**	DH8	YVR-FRA	**CP**	747	FRA-CAI	LH	310	23:00
44	53	SEA-YVR	**CP**	DH8	YVR-FRA	LH	747	FRA-CAI	LH	310	23:00
45	59	SEA-ORD	**LH**	757	ORD-FRA	**LH**	777	FRA-CAI	LH	310	23:10
45	75	SEA-LHR	UA	757	LHR-FRA	LH	AB3	FRA-CAI	LH	310	23:10
46	51	SEA-MSP	NW	757	MSP-AMS	NW	747	AMS-CAI	KL	310	23:25
46	54	SEA-MSP	**KL**	757	MSP-AMS	**KL**	747	AMS-CAI	KL	310	23:25

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
46	55	SEA-MSP	NW	757	MSP-AMS	**KL**	747	AMS-CAI	KL	310	23:25
46	56	SEA-MSP	NW	757	MSP-AMS	NW	747	AMS-CAI	**NW**	310	23:25
46	58	SEA-YVR	UA	733	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	23:25
48	77	SEA-ORD	AA	S80	LHR-FRA	LH	AB3	FRA-CAI	LH	310	23:27
49	71	SEA-YVR	**AS**	D38	YVR-FRA	LH	747	FRA-CAI	LH	310	23:35
49	72	SEA-YVR	**AS**	D38	YVR-FRA	**CP**	747	FRA-CAI	LH	310	23:35
50	73	SEA-YVR	**AC**	DH1	YVR-FRA	LH	747	FRA-CAI	LH	310	23:40
50	74	SEA-YVR	**AC**	DH1	YVR-FRA	**CP**	747	FRA-CAI	LH	310	23:40
51	70	SEA-YVR	**AC**	DH1	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	23:45
52	8	SEA-LGW	DL	CHG	LHR-CAI	MS	AB3				24:00
53	82	SEA-YVR	**CP**	DH8	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	24:30
54	89	SEA-YVR	**AS**	D38	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	25:05
54	92	SEA-YYC	**AS**	F28	YYC-FRA	CP	763	FRA-CAI	LH	310	25:05
54	93	SEA-YYC	**AS**	F28	YYC-FRA	**LH**	767	FRA-CAI	LH	310	25:05
56	90	SEA-YVR	**AC**	DH1	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	25:10
57	99	SEA-AMS	NW	D10	AMS-ZRH	SR	M81	ZRH-CAI	SR	310	25:15
57	100	SEA-AMS	NW	D10	AMS-ZRH	TG	M11	ZRH-CAI	SR	310	25:15
57	101	SEA-AMS	NW	D10	AMS-ZRH	MH	744	ZRH-CAI	SR	310	25:15
60	94	SEA-YVR	**AC**	DH1	YVR-FRA	LH	747	FRA-CAI	LH	310	26:10
60	95	SEA-YVR	**AC**	DH1	YVR-FRA	**CP**	747	FRA-CAI	LH	310	26:10
61	66	SEA-DTW	NW	757	DTW-AMS	KL	74M	AMS-CAI	KL	310	26:15
61	67	SEA-DTW	NW	757	DTW-AMS	**NW**	74M	AMS-CAI	KL	310	26:15
61	68	SEA-DTW	NW	757	DTW-AMS	**NW**	74M	AMS-CAI	**NW**	310	26:15
61	69	SEA-DTW	**KL**	757	DTW-AMS	KL	74M	AMS-CAI	KL	310	26:15
62	91	SEA-CVG	DL	72S	CVG-IST	TK	310	IST-CAI	TK	734	26:20
63	97	SEA-YVR	**AS**	DH8	YVR-FRA	LH	747	FRA-CAI	LH	310	26:25
63	98	SEA-YVR	**AS**	DH8	YVR-FRA	**CP**	747	FRA-CAI	LH	310	26:25
64	78	SEA-MSP	NW	D10	MSP-AMS	**KL**	747	AMS-CAI	KL	310	26:50
64	79	SEA-MSP	NW	D10	MSP-AMS	NW	747	AMS-CAI	KL	310	26:50
64	80	SEA-MSP	NW	D10	MSP-AMS	NW	747	AMS-CAI	**NW**	310	26:50
64	81	SEA-MSP	**KL**	D10	MSP-AMS	**KL**	747	AMS-CAI	KL	310	26:50
65	96	SEA-ORD	UA	733	ORD-IST	TK	310	IST-CAI	TK	734	26:59
66	106	SEA-YVR	**AC**	DH1	YVR-LHR	CP	D10	LHR-CAI	MS	310	27:40
67	111	SEA-YVR	**AS**	DH3	YVR-LHR	CP	D10	LHR-CAI	MS	AB3	27:55
68	102	SEA-DTW	**KL**	757	DTW-AMS	KL	74M	AMS-CAI	KL	310	30:10
68	103	SEA-DTW	NW	757	DTW-AMS	KL	74M	AMS-CAI	KL	310	30:10
68	104	SEA-DTW	NW	757	DTW-AMS	**NW**	74M	AMS-CAI	KL	310	30:10
68	105	SEA-DTW	NW	757	DTW-AMS	**NW**	74M	AMS-CAI	**NW**	310	30:10
69	107	SEA-MSP	NW	747	MSP-AMS	**KL**	747	AMS-CAI	KL	310	30:25
69	108	SEA-MSP	NW	747	MSP-AMS	NW	747	AMS-CAI	KL	310	30:25
69	109	SEA-MSP	NW	747	MSP-AMS	NW	747	AMS-CAI	**NW**	310	30:25
69	110	SEA-MSP	**KL**	747	MSP-AMS	**KL**	747	AMS-CAI	KL	310	30:25
70	112	SEA-MSP	NW	D10	MSP-AMS	**KL**	747	AMS-CAI	KL	310	31:50
70	113	SEA-MSP	NW	D10	MSP-AMS	NW	747	AMS-CAI	KL	310	31:50
70	114	SEA-MSP	NW	D10	MSP-AMS	NW	747	AMS-CAI	**NW**	310	31:50
70	115	SEA-MSP	**KL**	D10	MSP-AMS	**KL**	747	AMS-CAI	KL	310	31:50
71	116	SEA-DTW	TW	M80	DTW-AMS	KL	74M	AMS-CAI	KL	310	38:25
71	117	SEA-DTW	TW	M80	DTW-AMS	**NW**	74M	AMS-CAI	KL	310	38:25
71	118	SEA-DTW	TW	M80	DTW-AMS	**NW**	74M	AMS-CAI	**NW**	310	38:25

CRS ranking: with duplications

Elapsed ranking: ranking based on total elapsed time, with duplications counted only once

Bold type: flight operated by another carrier

: end-to-end codesharing routing

From SABRE listing for travel on Wednesday, 20 March 1996

Table A4-5. GUADALAJARA — WARSAW

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
1	3	GDL-IAH	CO	735	IAH-AMS	NW	74M	AMS-WAW	KL	737	15:30
1	4	GDL-IAH	CO	735	IAH-AMS	KL	74M	AMS-WAW	KL	737	15:30
2	2	GDL-DFW	AA	S80	DFW-FRA	DL	763	FRA-WAW	LO	735	15:56
3	5	GDL-MEX	JR	DC9	MEX-FRA	LH	74M	FRA-WAW	LH	320	16:35
3	6	GDL- MEX	AM	D9S	MEX-FRA	LH	74M	FRA-WAW	LH	320	16:35
3	7	GDL-MEX	MX	72S	MEX-FRA	LH	74M	FRA-WAW	LH	320	16:35
6	1	GDL-DFW	AA	S80	DFW-FRA	DL	763	FRA-WAW	DL	72S	16:36
7	8	GDL-DFW	AA	S80	DFW-EWR	AA	S80	EWR-WAW	LO	767	16:50
8	9	GDL-MEX	AM	M80	MEX-FRA	LH	320	FRA-WAW	LH	320	17:20
9	18	GDL-DFW	AA	S80	DFW-ORD	AA	S80	ORD-WAW	LO	763	17:25
9	19	GDL-DFW	AA	S80	DFW-ORD	UA	72A	ORD-WAW	LO	763	17:25
11	14	GDL-MEX	MX	320	MEX-FRA	LH	74M	FRA-WAW	LH	320	17:40
12	10	GDL-MEX	AM	M88	MEX-FRA	LH	74M	FRA-WAW	LH	320	17:50
13	23	GDL-LAX	AA	S80	LAX-FRA	DL	M11	FRA-WAW	LH	320	18:55
14	24	GDL-LAX	MX	320	LAX-FRA	DL	M11	FRA-WAW	LH	320	19:00
15	13	GDL-MEX	MX	74M	MEX-FRA	LH	74M	FRA-WAW	LH	320	19:10
15	31	GDL-JFK	AM	CHG	JFK-HEL	AY	M11	HEL-WAW	AY	D9S	19:10
17	35	GDL-MEX	GD	737	MEX-EWR	CO	733	EWR-WAW	LO	767	19:25
18	25	GDL-LAX	AA	S80	LAX-FRA	DL	M11	FRA-WAW	LO	735	19:30
19	26	GDL-LAX	MX	320	LAX-FRA	DL	M11	FRA-WAW	LO	735	19:35
20	11	GDL-MEX	AM	D9S	MEX-FRA	LH	74M	FRA-WAW	LH	320	19:45
21	20	GDL-LAX	DL	72S	LAX-LHR	BA	744	LHR-WAW	BA	737	19:55
22	32	GDL-IAH	CO	733	IAH-AMS	NW	74M	AMS-WAW	KL	737	20:15
22	33	GDL-IAH	CO	733	IAH-AMS	KL	74M	AMS-WAW	KL	737	20:15
23	12	GDL-MEX	MX	100	MEX-FRA	LH	74M	FRA-WAW	LH	320	20:40
24	29	GDL-LAX	AA	S80	LAX-LHR	NZ	744	LHR-WAW	BA	757	21:00
25	30	GDL-LAX	MX	320	LAX-LHR	NZ	744	LHR-WAW	BA	757	21:05
26	15	GDL-DFW	AA	S80	DFW-FRA	LH	340	FRA-WAW	LH	320	21:21
27	16	GDL-MEX	AM	M88	MEX-FRA	LH	74M	FRA-WAW	LH	320	21:25
28	21	GDL-LAX	AA	S80	LAX-LHR	BA	744	LHR-WAW	BA	737	21:35
28	22	GDL-LAX	AM	M80	LAX-LHR	BA	744	LHR-WAW	BA	737	21:35
30	17	GDL-MEX	MX	72S	MEX-FRA	LH	74M	FRA-WAW	LH	320	21:40
30	36	GDL-MIA	AM	M80	MIA-FRA	AA	763	FRA-WAW	DL	72S	21:40
30	40	GDL-MIA	AM	M80	MIA-FRA	DL	CHG	FRA-WAW	DL	72S	21:40
33	38	GDL-JFK	AM	CHG	JFK-VIE	50S	310	VIE-WAW	OS	M80	21:45
34	43	GDL-LAX	JR	DC9	LAX-LHR	NZ	744	LHR-WAW	BA	757	22:00
35	46	GDL-LAX	JR	DC9	LAX-LHR	NZ	744	LHR-WAW	LO	734	22:15
35	52	GDL-MEX	MX	320	MEX-EWR	CO	733	EWR-WAW	LO	767	22:15
37	27	GDL-MEX	MX	320	MEX-FRA	LH	74M	FRA-WAW	LH	320	22:20
38	28	GDL-MEX	AM	M88	MEX-FRA	LH	74M	FRA-WAW	LH	320	22:55
39	44	GDL-JFK	AM	CHG	JFK-LHR	BA	744	LHR-WAW	BA	757	23:00
40	47	GDL-PHL	CO	733	PHL-LHR	BA	741	LHR-WAW	BA	757	23:20
41	48	GDL-PHL	CO	733	PHL-LHR	BA	741	LHR-WAW	LO	734	23:35
41	*	GDL-MEX	MX	100	MEX-CDG	AM	763	CDG-WAW	LO/AF	734	23:35
43	45	GDL-MEX	AM	M80	MEX-MAD	DL	CHG	MAD-WAW	LO	734	23:40
44	34	GDL-MEX	AM	M80	MEX-FRA	LH	74M	FRA-WAW	LH	320	23:55
45	49	GDL-MEX	AM	D9S	MEX-MAD	DL	CHG	MAD-WAW	LO	734	24:10
45	50	GDL-MEX	MX	320	MEX-MAD	DL	CHG	MAD-WAW	LO	734	24:10
47	37	GDL-MEX	JR	DC9	MEX-FRA	LH	74M	FRA-WAW	LH	320	24:45
48	39	GDL-MEX	AM	D9S	MEX-FRA	LH	74M	FRA-WAW	LH	320	24:55
49	41	GDL-MEX	AM	D9S	MEX-FRA	LH	74M	FRA-WAW	LH	320	25:25
49	42	GDL-MEX	MX	72S	MEX-FRA	LH	74M	FRA-WAW	LH	320	25:25
51	55	GDL-LAX	JR	DC9	LAX-FRA	LH	747	FRA-WAW	LH	320	25:55
51	56	GDL-MEX	GD	737	MEX-MAD	DL	CHG	MAD-WAW	LO	734	25:55
51	65	GDL-MEX	AM	M80	MEX-JFK	AM	757	JFK-WAW	LO	763	25:55
51	70	GDL-MEX	AM	M80	MEX-JFK	DL	757	JFK-WAW	LO	763	25:55
55	61	GDL-MEX	MX	320	MEX-JFK	AM	757	JFK-WAW	LO	763	26:00
55	69	GDL-MEX	MX	320	MEX-JFK	DL	757	JFK-WAW	LO	763	26:00
57	51	GDL-MEX	AM	M80	MEX-FRA	LH	74M	FRA-WAW	LH	320	26:25

Ranking		1st segment			2nd segment			3rd segment			Elapsed Time
Elapsed	CRS	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	City-pair	Airline	Aircraft	
58	57	GDL-MEX	AM	D9S	MEX-JFK	AM	757	JFK-WAW	LO	763	26:45
58	68	GDL-MEX	AM	D9S	MEX-JFK	DL	757	JFK-WAW	LO	763	26:45
60	53	GDL-MEX	AM	D9S	MEX-FRA	LH	74M	FRA-WAW	LH	320	26:55
60	54	GDL-MEX	MX	320	MEX-FRA	LH	74M	FRA-WAW	LH	320	26:55
62	59	GDL-MEX	AM	D9S	MEX-JFK	AM	757	JFK-WAW	LO	763	27:20
62	60	GDL-MEX	AM	D9S	MEX-JFK	DL	757	JFK-WAW	LO	763	27:20
64	58	GDL-MEX	MX	100	MEX-JFK	AM	757	JFK-WAW	LO	763	27:50
64	66	GDL-MEX	MX	100	MEX-JFK	DL	757	JFK-WAW	LO	763	27:50
66	62	GDL-MEX	AM	M88	MEX-JFK	DL	757	JFK-WAW	LO	763	28:25
66	67	GDL-MEX	AM	M88	MEX-JFK	AM	757	JFK-WAW	LO	763	28:25
68	73	GDL-MEX	MX	320	MEX-MAD	DL	CHG	MAD-WAW	LO	734	28:45
69	63	GDL-MEX	AM	M80	MEX-JFK	AM	757	JFK-WAW	LO	763	29:25
69	64	GDL-MEX	AM	M80	MEX-JFK	DL	757	JFK-WAW	LO	763	29:25
71	71	GDL-MEX	GD	727	MEX-JFK	AM	757	JFK-WAW	LO	763	29:30
71	72	GDL-MEX	GD	727	MEX-JFK	DL	757	JFK-WAW	LO	763	29:30

CRS ranking: with duplications

Elapsed ranking: ranking based on total elapsed time, with duplications counted only once

Bold type: flight operated by another carrier

: end-to-end codesharing routing

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From SABRE listing for travel on Wednesday, 18 October 1995

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IN THE AIR TRANSPORT FIELD

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

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

Council Statements on policy relating to air transport questions, such as charges for airports and air navigation services, taxation and aims in the field of facilitation;

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

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

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

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

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