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Caribbean/South American Regional Traffic Forecasts 2004–2015

**Report of the Sixth Meeting
of the CAR/SAM Traffic
Forecasting Group (CAR/SAM TFG)**

Lima, 12–16 September 2005

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SIXTH MEETING OF THE CAR/SAM TRAFFIC FORECASTING GROUP

CAR/SAM TFG

(Lima, Peru, 12-16 September 2005)



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TABLE OF CONTENTS

	Page
1. Introduction	1
2. Route Group Forecasts	2
2.1 Methodology	2
2.2 Global Outlook.....	4
2.2.1 Economic Trends and Prospects.....	4
2.2.2 Historical Traffic Trends	5
2.2.3 Global Passenger Air Traffic Forecast	6
2.3 Outlook for the Latin American and Caribbean Region.....	6
2.3.1 Data Sources	6
2.3.2 Economic Trends and Prospects.....	6
2.3.3 Passenger Traffic Trends and Forecasts	7
2.4 Analysis of Load Factors and Capacity.....	7
2.5 Forecasts of Passenger Traffic and Aircraft Movements for Major Route Groups To, From and Within the Latin American and Caribbean Region	9
2.5.1 South Atlantic	9
2.5.2 Mid-Atlantic	11
2.5.3 Intra-South America	13
2.5.4 Between South America and Central America/Caribbean	15
2.5.5 Intra-Central America/Caribbean	17
2.5.6 Between North America and South America and Central America/Caribbean.....	19
2.6 Summary of Major Route Group Forecasts.....	21
2.6.1 Passenger Forecast.....	21
2.6.2 Aircraft Movements Forecast	22
3. Airport Movements Forecast	23
4. Critical Aircraft Types and Peak-Period Analysis.....	29
Appendix 1: Peak-Period Analysis of Top 25 Airports in the Latin America and Caribbean Region.....	30
Appendix 2: List of Participants	81

1. INTRODUCTION

1.1 The main purpose of the Caribbean/South American (CAR/SAM) Region Traffic Forecasting Group (TFG), formed in 1996, is to support the planning of air navigation services in the Region. Traffic forecasts and the analysis of peak-period planning parameters are important in anticipating where and when airspace and airport congestions may occur. It is then possible to plan for the required expansion of capacity. These forecasts also have an important role in planning the implementation of CNS/ATM systems. The primary users of the forecasts developed by the CAR/SAM TFG are expected to be Member States of ICAO, air navigation service providers in the region, and the ICAO planning and implementation regional group for CAR/SAM (GREPECAS).

1.2 The CAR/SAM TFG to date has held 6 meetings. The last meeting, held in Lima from 12 to 16 September 2005, developed a new set of forecasts for the six major route groups to, from and within the Region, taking into account the recent developments. These forecasts also include traffic projections for the top 25 city pairs in each of the major route groups. In addition, the aircraft movements forecasts and the analysis of peak-period planning parameters for the top 25 airports in the Latin American and Caribbean region were also developed, in response to GREPECAS' requirements.

2. ROUTE GROUP FORECASTS

2.1 Methodology

2.1.1 Traffic to, from and within the CAR/SAM Region has previously been classified, by the Group, into six major route groups as described below:

- 1) South Atlantic
- 2) Mid-Atlantic
- 3) Intra-South America
- 4) Between South America and Central America/Caribbean
- 5) Intra-Central America/Caribbean
- 6) Between North America and South America and Central America/Caribbean

2.1.2 The demand for air travel is primarily determined by economic developments, notably the growth of global and regional economies as measured by variations in GDP, and the cost of air travel as measured by yields (gross passenger revenue divided by passenger-kilometres performed). It is also assumed that the political and general economic climate are generally conducive to growth; however, no specific assumptions are made about various possible political and economic scenarios beyond those implicit in the basic GDP growth rates' forecast. World energy demand, supply and prices are important both to economic progress and to the cost of air travel.

2.1.3 The first step in forecasting is to develop a model which can be used to explain the causes of historical traffic changes and to forecast future traffic. The Group considered several types of models. The statistical model providing the best fit to traffic data was one which used GDP and real yield in a multiplicative form. The logarithmic transformation causes the statistical model to be based on rates of change, rather than absolute changes in the values of the variables.

2.1.4 Following testing and evaluation of various functional forms and explanatory variables, the Group decided that a log-log model (in terms of natural logarithmic values) of the functional form given below provides the most satisfactory explanation of likely future trends. The data used to estimate the model are cross-sectional data from the six regions defined by CAR/SAM TFG with the time series data from 1993 to 2004. Dummy variables were introduced to the model to capture the characteristics of some route groups (South Atlantic (1), Mid-Atlantic (2), Intra-South America (3) and between South America and Central America/Caribbean (4)). The introduction of the dummy variables provided a more accurate simulation of the historical traffic data and improved the predicting capability of the model.

$$\text{Log (Passengers)} = \text{Constant} + A \text{ Log(GDP)} + B \text{ Log(Yield)} + \text{Dummy Variables}$$

In this functional form, A and B are constant coefficients which represent elasticities.

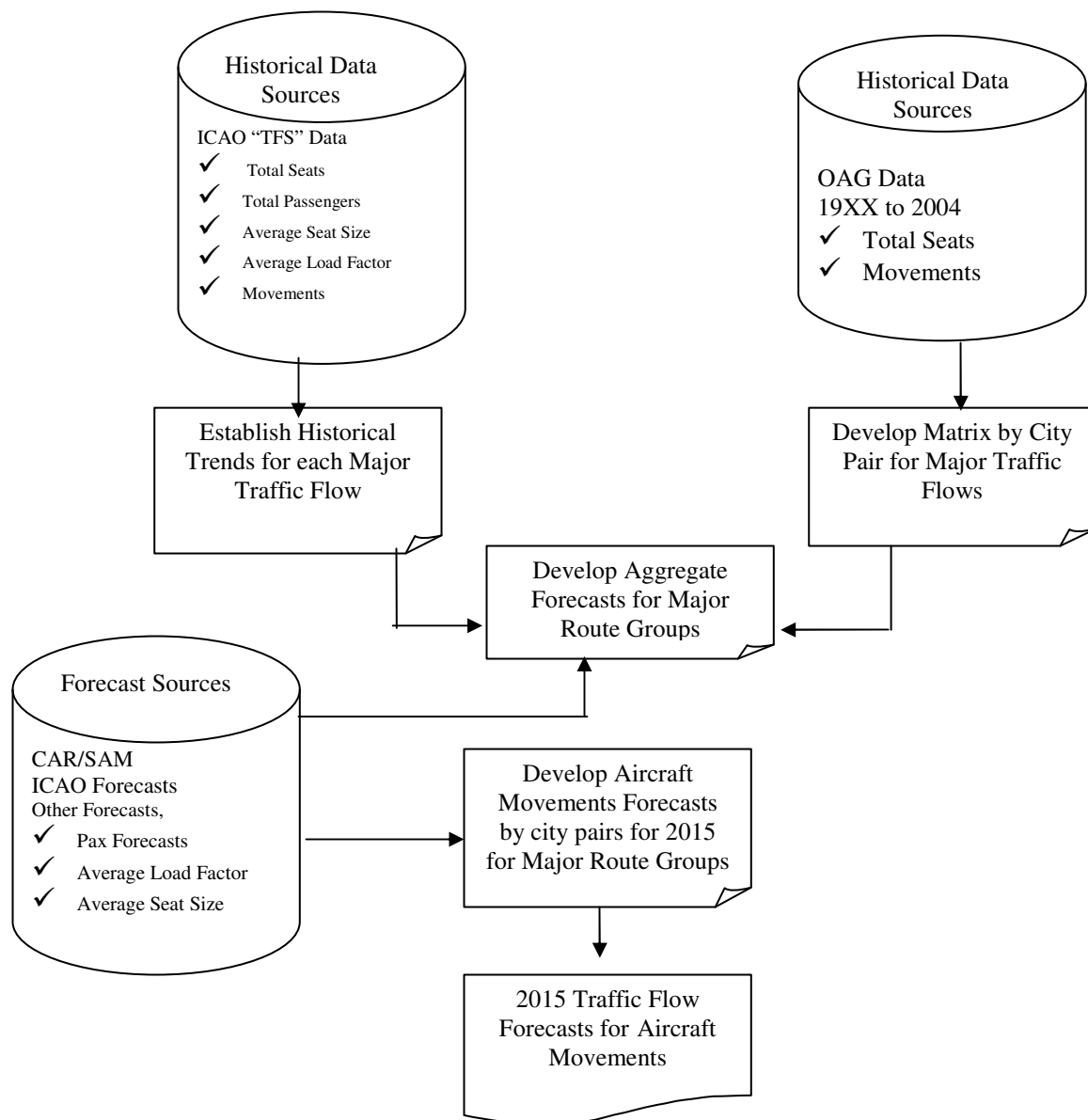
The analysis resulted in the following formula:

$$\text{Ln (Passengers)} = -5.04 + 1.12 \ln(\text{GDP}) - 0.9 \ln(\text{Yield}) + 0.4 (D_1) + 1.97 (D_2) + 0.86 (D_3) - 0.67(D_4)$$

$$(R^2 = 0.98, t_{\text{GDP}} = 22.66, t_{\text{Yield}} = -5.48, t_{D1} = 2.88, t_{D2} = 8.67, t_{D3} = 12.15, t_{D4} = 10.89)$$

2.1.5 The methodology flowchart below (**Figure 1**) describes the step-by-step approach used in the development of air traffic movements' forecasts for the major route groups of the region.

FIGURE 1
METHODOLOGY FLOWCHART



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2.1.6 The historical trends in total seats offered, average aircraft seats, average load factor as well as aircraft movements were established for each of the route groups concerned by utilizing the Traffic by Flight Stage (TFS) data compiled by ICAO.

2.1.7 For each of the major route groups concerned, a detailed city-pair traffic flow was developed using the 2004 Official Airline Guide (OAG) data provided by Back Associates as the basis. A relationship between the TFS data and the aircraft movement data from the OAG was established.

2.1.8 Forecasts of aircraft movements in a particular route group can be derived from forecasts of passengers and assumptions about future trends in load factors and average aircraft size. The link between these variables is given by:

$$\begin{aligned}\text{Aircraft movements} &= \frac{\text{passenger numbers}}{(\text{passengers/seats}) * (\text{seats per aircraft})} \\ &= \frac{\text{passenger numbers}}{(\text{load factor}) * (\text{average aircraft seats})}\end{aligned}$$

2.1.9 Judgements would be necessary about whether gradual improvements in load factors could be expected from marketing initiatives and yield programs. Assumptions were made about future trends in average aircraft size based on expectations about the types of aircraft that might be introduced over the forecast period. Historical trends as well as data relating to aircraft orders were also used to formulate these assumptions.

2.1.10 The route group aircraft movement forecasts were then allocated to each of the city-pairs taking into account traffic service patterns, types of aircraft, demographics and other pertinent factors.

2.2 Global Outlook

2.2.1 Economic trends and prospects

2.2.1.1 Between 1994 and 2004, the aggregate world economy measured in terms of Gross Domestic Product (GDP) grew at an average annual rate of 3.4 per cent in real terms. Growth rates varied across regions, from a high of 4.4 per cent for Asia/Pacific to a low of 2.3 for Europe including the “countries-in-transition” in Eastern Europe and the Commonwealth of Independent States (CIS). Between 1994 and 2004, world population increased at an average annual rate of 1.3 per cent. Hence growth of the world’s GDP per capita between 1994 and 2004 increased at an average annual rate of 2.1 per cent, significantly lower than the growth of GDP itself.

2.2.1.2 After the 1998 slowdown, the world economy regained strength in 1999 with an estimated GDP growth of 3.1 per cent, mainly based on economic recovery in the Asia/Pacific region and continued strong growth in the United States' economy. The economy continued to expand in 2000 by 4.6 per cent but experienced a slowdown in 2001 in almost all regions. The events of 11 September 2001 amplified the impact on consumer and business confidence, demand and activity, particularly in the United States. Consequently, the global economy grew by only 2.4 per cent in 2001. The world GDP showed signs of improvement during 2002 and 2003 growing at a rate of 3.0 and 3.9 per cent, respectively. The world economy continued its recovery during the year 2004 and has posted a very strong growth of about 5.1 per cent, the highest level achieved throughout the last decade. In terms of future prospects, the global economy is expected to grow by 4.7 per cent in 2005. The economy is expected to remain strong in 2006 and 2007 with growth rates of 4.3 and 4.2 per cent, respectively. The long-term average annual growth rate is forecast to be 2.5 per cent (2004-2015).

2.2.2 Historical traffic trends

2.2.2.1 Total scheduled airline traffic, measured in terms of passenger-kilometres performed, grew at an average annual rate of 5.1 per cent between 1994 and 2004. In broad terms, the pattern of passenger traffic growth over the 1994-2004 period was a reflection of economic conditions experienced over this period. The economic recession in 1991 had a serious effect on air traffic. The recovery in traffic in 1992, which occurred despite continuing poor economic performance, was achieved at a cost of significantly reduced revenue yield. Although real yields declined further in 1993 and 1994, the stimulating effect on traffic demand was less dramatic than had been the case in 1992. On the other hand, economic growth began to provide a more solid foundation for traffic growth. These trends continued until 1997 but reversed in 1998 when GDP grew only at 2.1 per cent, leading to declining growth rates for passenger traffic. However, a strong economic performance during 1999 and 2000 resulted in traffic expansion of 6.5 and 8.6 per cent, respectively. The events of 11 September 2001 exacerbated the already weak economic environment. While GDP grew moderately at a rate of 2.4 per cent in 2001, traffic declined by an estimated 2.9 per cent, only the second decline since the Second World War. Even though the economic activity showed improvement during the post 9/11 years, the world traffic growth remained stagnant and growths of only 0.5 and 0.9 per cent were recorded during 2002 and 2003, respectively. The world traffic rebounded in 2004 and registered 14 per cent growth, reflecting the strong recovery by the airlines in Asia/Pacific (the region worst affected by the SARS outbreak), improved performance of some regional economies and the sustained expansion of the Middle East economy.

2.2.2.2 The prospects for airline yields are closely related to cost developments and market conditions in the airline industry. Productivity improvement in the airline industry should continue to produce cost savings, thereby providing some potential for real reductions in air fares. Changes in fuel prices have had important effects on costs, and hence on both financial returns and airline yields, at certain times in the past. In the past decade, with the exception of 1996, fuel price volatility has been short term, with limited impact on year-average price levels and airline yields. However, after soaring in 1999 and 2000, prices declined moderately in 2001. Fuel prices rose again in 2002 and 2003. Moreover, during 2004 and the first half of 2005, oil prices escalated sharply and reached record breaking high levels inflicting financial strain on the world airline industry. Driven by a very high demand of crude especially in the third quarter of 2005, these prices have reached levels which have never been observed previously. It is anticipated that these new hikes will have paramount impact on the aviation industry in the short term. It is, however, foreseen that oil prices on the average will stabilize in the near future but will remain moderately on the higher side. These various cost pressures will provide a benchmark for airline yields, with revenues needing to be sufficient to cover costs over the long term. However, in the short term, movements in yields will be influenced by competitive conditions in airline markets.



2.2.3 Global passenger air traffic forecast

2.2.3.1 The global scheduled passenger traffic forecasts for the entire forecast period have been developed based on the economic and yield assumptions described above. General economic performance is expected to provide the main support for traffic demand. After achieving a high growth of 14 per cent in 2004, the global passenger traffic measured in passenger-kilometres is expected to show a moderate growth of 7.6 per cent in 2005 with further growths of 6.5 per cent and 6.2 per cent in 2006 and 2007, respectively. Assuming continuation of restored consumer confidence and a stable economic and operating environment, passenger traffic is forecast to grow at an average annual rate of 4.4 per cent during the period 2004-2015.

2.3 Outlook For The Latin American And Caribbean Region

2.3.1 Data sources

2.3.1.1 In order to study the relationship between traffic and socio-economic trends in the Latin American and Caribbean Region, data from several sources were collected on the economies of the countries in the area. GDP historical and forecast data originate from *Global Insight*. Airline yield information was obtained from ICAO. The relevant forecasts were adjusted by the CAR/SAM TFG based on the most recent information available from other sources.

2.3.2 Economic trends and prospects

2.3.2.1 Over the 1994-2004 period, the aggregate Latin American and Caribbean economy grew at an average annual rate of 2.5 per cent in real terms, whereas GDP per capita grew only at 0.9 per cent.

2.3.2.2 The economy in this region was severely affected by recession in the late 1980s but a robust recovery started in 1991. After a record of 5.3 per cent growth in 1997, the regional economy started to decline dramatically to a 2.0 per cent growth in 1998 and further plunged to 0.2 per cent growth in 1999. The financial market setback led Brazil to introduce severe austerity measures. Other countries in the region, such as Peru, Ecuador, El Salvador, Honduras and Nicaragua, suffered from the adverse effects of repeated natural disasters which resulted in constricted output, especially due to devastation in the agricultural and industrial sectors, and consequently declining overall economic performance. While the Latin American and Caribbean Region enjoyed above average growth in the 1990s, due mainly to large capital inflows; the years 2000 and 2001 have experienced relatively weak growth. The region was severely affected by the 2001 slowdown and the 2002 recession. In 2003, recovery began to take its root and as a result, GDP showed positive growth. During 2004, with the world's economy enjoying an impressive growth (5.1 %), the Latin American and Caribbean Region also registered a high growth rate of about 5.7 per cent.

2.3.2.3 **Table 1** below shows GDP growth rates for the major economies in the region. Even though economic prospects are very divergent in this region because States are driven more by domestic forces than international ones, the GDP has been steadily growing at a healthier rate since 2003. Brazil, the largest country in the region, has had tremendous development in the agriculture sector which led to a GDP growth rate of 5.2 per cent in 2004. The Chilean economy, which is the least dependent upon foreign investment, grew by 5.9 per cent in 2004, up from 3.3 per cent in 2003. Chile is anticipated to lead this group in the near-to medium-term period. Argentina, Colombia, Mexico and Peru have also registered healthy growth rates in 2004. During the same period, Venezuela registered the highest GDP growth (17.3%) due to the economic recovery, following a decline in 2002 and 2003. The aggregate

major economies of the region are expected to record an increase of 4.0 per cent in 2005, 3.4 per cent in 2006, 3.6 per cent in 2007 and 3.8 per cent in 2008. This compares with global forecasts of 4.3, 4.4, 4.2 and 4.0 per cent for the years 2005, 2006, 2007 and 2008, respectively.

TABLE 1
GDP GROWTH RATES FOR THE REGION'S MAJOR ECONOMIES

Country	GDP Growth Rate (per cent)					
	Estimate	Forecast				
		2004	2005	2006	2007	2008
Argentina	8.8	5.8	3.9	3.2	3.0	3.7
Brazil	5.2	4.2	3.9	3.7	3.6	3.6
Chile	5.9	5.1	5.5	5.3	5.1	5.1
Colombia	4.0	3.9	3.7	4.3	4.2	3.9
Mexico	4.2	4.1	3.2	4.3	4.2	4.2
Peru	5.1	5.2	4.6	4.5	4.5	4.3
Venezuela	17.3	6.6	4.1	3.8	3.8	4.1
Latin America and Caribbean Region*	5.7	4.0	3.4	3.6	3.8	3.8
Total World	5.1	4.3	4.4	4.2	4.0	2.5

*Regional growth rates based on all the countries in the region.

Source: ICAO/Global Insight.

2.3.3 Passenger traffic trends and forecasts

2.3.3.1 Over the 1994-2004 period, the scheduled passenger traffic (in PKPs) of airlines of the Latin American and Caribbean Region increased at an average annual rate of 3.3 per cent (compared to the world average growth rate of 5.1 per cent). Until the year 2000, flag carrier privatization, intra-regional mergers and alliances along with extensive fleet and route rationalization were among measures that enabled airlines of the region to capture a larger share of the United States-Latin American and Caribbean traffic, one of the world's fastest growing aviation markets. Following very high traffic growth rates for 1997 and 1998 (9.5 and 7.8 per cent, respectively), total passenger traffic dropped in 1999 by 0.3 per cent, rebounded in 2000 with a 4.4 per cent growth, then declined again by 5.1 per cent in 2001. Traffic in 2002 dropped further by 1.6 per cent before gaining strength in 2003 (3.8 %) and 2004 (8.4 %).

2.3.3.2 Traffic is expected to continue its trend of high growth over the medium term along with economic activity. Scheduled passenger traffic of the airlines of the Latin American and Caribbean Region is anticipated to grow by 6.2, 5.5 and 5.6 per cent in 2005, 2006 and 2007, respectively, compared to the forecast growth rates for the world of 7.6, 6.5 and 6.2 per cent, respectively. Over the long term, traffic of the airlines of the Region is expected to grow at an average annual rate of 4.0 per cent up to the year 2015.

2.4 Analysis of Load Factors and Capacity

2.4.1 The projections of load factors and average aircraft seats for the year 2015 have been developed using the approach described in the Methodology section.

2.4.2 **Table 2 a)** depicts the historical and projected load factors for the major route groups to, from and within the CAR/SAM Region.

2.4.3 Compared to the year 2004 levels, load factors are projected to be slightly higher in 2015 on all route groups with the exception of North America and South America/Central America/Caribbean where it is anticipated to remain unchanged.

TABLE 2 a)

ANALYSIS OF LOAD FACTORS (PER CENT)

Route Groups	Historical				Forecast
	1982	1990	2000	2004	2015
South Atlantic	54	75	77	76	77
Mid-Atlantic	67	65	79	76	78
Intra-South America	44	55	61	65	67
Between South America and Central America/Caribbean	51	61	53	69	71
Intra-Central America/Caribbean	44	54	65	65	66
Between North America and South America and Central America/Caribbean	54	64	70	70	70

2.4.4 The evolution of the average aircraft seats for each of the route groups for the period 1982-2004 and the projected average aircraft seats for the year 2015 are provided in **Table 2 b)**.

TABLE 2 b)

ANALYSIS OF CAPACITY (AVERAGE AIRCRAFT SEATS)

Route Groups	Historical				Forecast
	1982	1990	2000	2004	2015
South Atlantic	266	278	275	297	300
Mid-Atlantic	289	278	301	299	300
Intra-South America	181	194	159	158	165
Between South America and Central America/Caribbean	200	201	164	162	170
Intra-Central America/Caribbean	149	189	103	105	105
Between North America and South America and Central America/Caribbean	207	198	175	166	170

2.4.5 The average aircraft seats in 2015 are expected to vary from a low of 105 seats for the Intra Central America/Caribbean route group to a high of 300 seats for the Mid-Atlantic and South Atlantic route groups.

2.5 FORECASTS OF PASSENGER TRAFFIC AND AIRCRAFT MOVEMENTS FOR MAJOR ROUTE GROUPS TO, FROM AND WITHIN THE LATIN AMERICAN AND CARIBBEAN REGION

2.5.1 South Atlantic

2.5.1.1 **Table 3 a)** depicts the development of the South Atlantic traffic for the period 1995-2004 and the forecast to the year 2015. Passenger traffic grew at an average annual growth rate of 6.1 per cent, from some 3.3 million passengers in 1995 to about 5.6 million passengers in 2004.

2.5.1.2 For the period 2004-2015, passenger traffic is expected to grow at an average annual growth rate of 5.2 per cent, reaching approximately 9.8 million passengers in the year 2015.

TABLE 3 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	3.30	79.0	304
	2000	4.80	79.0	263
	2001	4.34	75.0	226
	2002	4.35	77.0	297
	2003	4.79	77.0	280
	2004	5.63	76.0	297
	2015	9.79	77	300
Average Annual Growth (Per cent)	1995-2004	6.1	-0.4	-0.3
	2004-2015	5.2	0.1	0.1

2.5.1.3 The aircraft movements for the period 2004-2015 are projected to grow at an average annual growth rate of 4.9 per cent, reaching almost 42 500 movements in the year 2015, as illustrated in **Table 3b).**

TABLE 3 b)

Aircraft Movements	
2004* (historic)	24 930
2015 (forecast)	42 381
Average Annual Growth (Per cent) 2004-2015	4.9

* OAG data

Note: In the Table 3 a) the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 3 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.1.4 Aircraft movements forecast for the top 25 city-pairs within the route group are illustrated in **Table 3 c)**.

TABLE 3 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth (Per cent) 2004-2015
1	Madrid-Buenos Aires	2 762	4 626	4.8
2	Sao Paulo-Paris	2 361	3 872	4.6
3	Sao Paulo-London	1 463	2 399	4.6
4	Sao Paulo-Frankfurt	1 462	2 553	5.2
5	Sao Paulo-Madrid	1 462	2 398	4.6
6	Sao Paulo-Lisbon	1 416	2 322	4.6
7	Santiago-Madrid	1 395	2 488	5.4
8	Sao Paulo-Milan	1 240	2 099	4.9
9	Rio de Janeiro-Paris	884	1 496	4.9
10	Rio de Janeiro-Madrid	854	1 461	5.0
11	Recife-Lisbon	766	1 380	5.5
12	Salvador-Lisbon	734	1 295	5.3
13	Frankfurt-Buenos Aires	732	1 252	5.0
14	Paris-Buenos Aires	732	1 200	4.6
15	Rio de Janeiro-Frankfurt	729	1 196	4.6
16	Sao Paulo-Johannesburg	721	1 158	4.4
17	Lisbon-Fortaleza	717	1 201	4.8
18	Rio de Janeiro-Lisbon	701	1 212	5.1
19	Rome-Buenos Aires	620	1 072	5.1
20	Zurich-Sao Paulo	573	990	5.1
21	Sao Paulo-Amsterdam	546	944	5.1
22	Milan-Buenos Aires	437	788	5.5
23	Salvador-Madrid	353	636	5.5
24	Cape Town-Buenos Aires	208	375	5.5
25	Sao Paulo-Rome	208	375	5.5
	All Other	854	1 594	5.8
	Total Traffic	24 930	42 381	4.9

^{1/} Both directions.

^{2/} OAG data.

2.5.2 Mid-Atlantic

2.5.2.1 **Table 4 a)** depicts the development of traffic on the Mid-Atlantic route group for the period 1995-2004 and the forecast to the year 2015. Mid-Atlantic traffic grew from 4.3 million passengers in 1995 to some 6.4 million passengers in 2004 which is an average annual growth rate of 4.5 per cent.

2.5.2.2 For the period 2004-2015, passenger traffic is forecast to grow at an average annual growth rate of 5.1 per cent, reaching approximately 11.1 million passengers in the year 2015.

TABLE 4 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	4.32	76.0	280
	2000	5.85	79.0	297
	2001	6.19	79.0	295
	2002	5.99	79.5	294
	2003	6.07	78.7	294
	2004	6.44	78.7	299
Forecast	2015	11.10	78.0	300
Average Annual Growth (Per cent)	1995-2004	4.5	0.4	0.7
	2004-2015	5.1	-0.1	0.0

2.5.2.3 The aircraft movements for the period 2004-2015 are projected to increase at an average annual growth rate of 5.1 per cent, reaching some 78 250 movements in the year 2015, as illustrated in **Table 4 b).**

TABLE 4 b)

Aircraft Movements	
2004* (historic)	45 196
2015 (forecast)	78 250
Average Annual Growth (Per cent) 2004-2015	5.1

* OAG data.

Note: In the Table 4 a) the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 4 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.2.4 Aircraft movements' forecasts for the top 25 city-pairs within the route group are illustrated in **Table 4 c)**.

TABLE 4 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth (Per cent) 2004-2015
1	Pointe-A-Pitre - Paris	2 578	4 409	5.0
2	Paris - Fort de France	2 453	4 195	5.0
3	Mexico City - Madrid	2 157	3 689	5.0
4	London - Bridgetown	1 908	3 229	4.9
5	Madrid - Caracas	1 770	3 059	5.1
6	Madrid - Havana	1 581	2 790	5.3
7	Madrid - Bogota	1 465	2 506	5.0
8	Paris - Mexico City	1 421	2 430	5.0
9	London - Antigua	1 212	2 051	4.9
10	Santo Domingo - Madrid	1 205	2 083	5.1
11	Bonaire - Amsterdam	1 110	1 918	5.1
12	Mexico City - Frankfurt	1 000	1 728	5.1
13	Madrid - Lima	922	1 594	5.1
14	ao - Amsterdam	876	1 514	5.1
15	Paris - Cayenne	732	1 226	4.8
16	Mexico City - Amsterdam	730	1 275	5.2
17	St Maarten - Paris	713	1 245	5.2
18	Paris - Havana	692	1 209	5.2
19	Paris - Caracas	688	1 202	5.2
20	Madrid - Guayaquil	687	1 200	5.2
21	Paramaribo - Amsterdam	666	1 163	5.2
22	Punta Cana - Frankfurt	594	1 027	5.1
23	Frankfurt - Caracas	582	1 006	5.1
24	Montego Bay - London	566	978	5.1
25	London - Kingston	535	925	5.1
	All Other	16 353	28 598	5.2
	Total Traffic	45 196	78 250	5.1

^{1/} Both directions.

^{2/} OAG data

2.5.3 Intra-South America

2.5.3.1 **Table 5 a)** depicts the development of traffic within South America for the period 1995-2004 and the forecast to the year 2015. The passenger traffic within South America increased from 4.1 million in 1995 to approximately 8 million passengers in 2004 at an average annual growth rate of 7.8 per cent.

2.5.3.2 For the period 2004-2015, passenger traffic is forecast to grow at an average annual growth rate of 4.8 per cent, reaching over 13.4 million passengers in the year 2015.

TABLE 5 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	4.07	55.0	170
	2000	5.93	61.0	171
	2001	5.59	55.9	158
	2002	6.04	63.0	157
	2003	7.11	60.9	158
	2004	8.03	64.6	158
Forecast	2015	13.40	67.0	165
Average Annual Growth (Per cent)	1995-2004	7.8	1.8	-0.8
	2004-2015	4.8	0.3	0.4

2.5.3.3 The aircraft movements forecast for the period 2004-2015 are projected to increase at an average annual growth rate of 4.0 per cent, reaching around 151 500 in the year 2015, as illustrated in **Table 5 b).**

TABLE 5 b)

Aircraft Movements	
2004* (historic)	98 451
2015 (forecast)	151 434
Average Annual Growth (Per cent) 2004-2015	4.0

* OAG data.

Note: In the Table 5 a) the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 5 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.3.4 Aircraft movement forecasts for the top 25 traffic flows within South America are illustrated in **Table 5 c)**.

TABLE 5 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth(Per cent) 2004-2015
1	Santiago - Buenos Aires	11 411	17 753	4.1
2	Montevideo - Buenos Aires	10 749	16 901	4.2
3	Sao Paulo - Buenos Aires	8 732	13 301	3.9
4	Punta Del Este - Buenos Aires	5 507	8 389	3.9
5	Caracas - Bogota	4 334	6 887	4.3
6	Quito - Bogota	3 964	6 299	4.3
7	Rio de Janeiro - Buenos Aires	3 446	5 361	4.1
8	Santiago - Lima	3 113	4 792	4.0
9	Sao Paulo - Santiago	2 990	4 652	4.1
10	Santiago - Mendoza	2 696	4 329	4.4
11	Lima - Buenos Aires	2 651	4 168	4.2
12	Sao Paulo - Asuncion	2 217	3 413	4.0
13	Sao Paulo - Montevideo	1 964	3 154	4.4
14	Sao Paulo - Santa Cruz	1 884	3 057	4.5
15	Lima - Bogota	1 729	2 747	4.3
16	Lima - Guayaquil	1 604	2 443	3.9
17	Buenos Aires - Asuncion	1 453	2 213	3.9
18	Sao Paulo - Lima	1 431	2 180	3.9
19	Santa Cruz - Buenos Aires	1 415	2 272	4.4
20	Santa Cruz - Asuncion	1 382	2 105	3.9
21	Lima - Caracas	1 346	2 050	3.9
22	Quito - Lima	1 315	2 068	4.2
23	Lima - La Paz	1 198	1 825	3.9
24	Porto Alegre - Montevideo	1 188	1 810	3.9
25	Porto Alegre - Buenos Aires	1 163	1 772	3.9
	All Other	17 569	25 492	3.4
	Total Traffic	98 451	151 434	4.0

^{1/} Both directions.

^{2/} OAG data.

2.5.4 Between South America and Central America/Caribbean

2.5.4.1 **Table 6 a)** depicts the development of traffic between South America and Central America/Caribbean for the period 1995-2004 and the forecast to the year 2015. The passenger traffic increased from about one million in 1995 to almost 2.7 million in 2004 at an average annual growth rate of 11.4 per cent.

2.5.4.2 For the period 2004-2015, passenger traffic is forecast to increase at an average annual growth rate of 4.7 per cent, reaching some 4.4 million passengers in 2015.

TABLE 6 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	1.02	54.0	165
	2000	2.19	58.0	153
	2001	2.58	63.3	162
	2002	2.38	56.8	158
	2003	2.33	66.3	160
	2004	2.69	69.1	162
Forecast	2015	4.44	71.0	170
Average Annual Growth (Per cent)	1995-2004	11.4	2.8	-0.2
	2004-2015	4.7	0.2	0.4

2.5.4.3 The aircraft movements for the period 2004-2015 are projected to increase at an average annual growth rate of 3.9 per cent, reaching some 72 750 movements in the year 2015, as illustrated in **Table 6 b).**

TABLE 6 b)

Aircraft Movements	
2004* (historic)	47 519
2015 (forecast)	72 758
Average Annual Growth (per cent) 2004-2015	3.9

* OAG data.

Note: In the Table 6-A the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 6 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.4.4 Aircraft movement forecasts for the top 25 city pairs within the route group are provided in **Table 6 c)**.

TABLE 6 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth (Per cent) 2004-2015
1	Las Piedras - Aruba	3 360	5 118	3.9
2	Port Of Spain - Georgetown	2 745	4 181	3.9
3	Panama City - Bogota	2 556	3 893	3.9
4	Georgetown - Bridgetown	2 183	3 325	3.9
5	Fort De France - Cayenne	1 964	2 992	3.9
6	Panama City - Guayaquil	1 626	2 477	3.9
7	Panama City - Lima	1 408	2 214	4.2
8	Panama City - Caracas	1 324	2 060	4.1
9	Caracas - Aruba	1 244	1 895	3.9
10	Santiago - Mexico City	1 238	1 886	3.9
11	Curacao - Caracas	1 216	1 852	3.9
12	Sao Paulo - Mexico City	1 207	1 839	3.9
13	Mexico City - Lima	1 165	1 775	3.9
14	Mexico City - Bogota	1 151	1 772	4.0
15	Port Of Spain - Caracas	1 115	1 753	4.2
16	San Jose - Lima	1 090	1 643	3.8
17	Panama City - Medellin	1 046	1 593	3.9
18	Quito - Panama City	1 043	1 589	3.9
19	Panama City - Cartagena	905	1 379	3.9
20	Maracaibo - Aruba	872	1 328	3.9
21	San Jose - Bogota	766	1 167	3.9
22	Panama City - Buenos Aires	749	1 141	3.9
23	Panama City - Cali	732	1 139	4.1
24	San Jose - Caracas	732	1 115	3.9
25	Sao Paulo - Panama City	732	1 115	3.9
	All Other	13 350	20 518	4.0
	Total Traffic	47 519	72 758	3.9

^{1/} Both directions.

^{2/} OAG data.

2.5.5 Intra-Central America/Caribbean

2.5.5.1 **Table 7 a)** depicts the development of traffic within the Central America/Caribbean for the period 1995-2004 and the forecast to the year 2015. The passenger traffic increased from about 2.3 million passengers in 1995 to around 3.7 million passengers in 2004 at an average annual growth rate of 5.2 per cent.

2.5.5.2 For the period 2004-2015, passenger traffic is forecast to grow at an average annual growth rate of 4.7 per cent, reaching some 6.1 million passengers in 2015.

TABLE 7 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	2.32	55.0	110
	2000	3.52	63.0	106
	2001	3.37	60.4	103
	2002	3.48	60.2	104
	2003	2.88	55.8	105
	2004	3.67	64.7	105
Forecast	2015	6.08	66.0	105
Average Annual Growth (Per cent)	1995-2004	5.2	1.8	-0.5
	2004-2015	4.7	0.2	0.0

2.5.5.3 The aircraft movements for the period 2004-2015 are projected to increase at an average annual growth rate of 4.5 per cent, reaching some 501 500 movements in the year 2015, as illustrated in **Table 7 b).**

Table 7 b)

Aircraft Movements	
2004* (historic)	308 281
2015 (forecast)	501 536
Average Annual Growth (Per cent) 2004-2015	4.5

* OAG data.

Note: In the Table 7-A the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 7 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.5.4 Aircraft movement forecasts for the top 25 city-pairs within the region are illustrated in **Table 7 c).**

TABLE 7 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth (Per cent) 2004-2015
1	St. Thomas - San Juan	21 685	43 352	6.5
2	St. Maarten - St. Barthelemy	20 058	36 146	5.5
3	Tortola - San Juan	16 449	26 694	4.5
4	St. Croix - San Juan	10 703	17 369	4.5
5	Pointe A Pitre - Fort De France	9 213	14 951	4.5
6	St. Lucia - Barbados	7 470	12 123	4.5
7	Curacao - Aruba	6 823	11 073	4.5
8	St. Vincent - Barbados	6 221	10 096	4.5
9	St. Maarten - San Juan	6 060	12 115	6.5
10	St. Kitts - Antigua	5 940	9 640	4.5
11	St. Maarten - St. Kitts	5 833	9 466	4.5
12	Santo Domingo - San Juan	4 903	7 957	4.5
13	Tortola - St. Maarten	4 728	7 673	4.5
14	Port Of Spain - Grenada	4 524	7 342	4.5
15	St. Lucia - Fort De France	4 226	8 804	6.9
16	St. Maarten - Anguilla	4 156	6 745	4.5
17	Port Of Spain - Barbados	3 843	6 573	5.0
18	Virgin Gorda - St. Thomas	3 818	6 196	4.5
19	Grenada - Barbados	3 745	6 078	4.5
20	San Juan - Punta Cana	3 724	6 237	4.8
21	Virgin Gorda - San Juan	3 714	6 027	4.5
22	San Jose - Panama City	3 698	6 664	5.5
23	St. Lucia - Antigua	3 469	5 630	4.5
24	St. Kitts - San Juan	3 235	5 250	4.5
25	Dominica - Antigua	3 207	5 204	4.5
	All Other	136 836	206 132	3.8
	Total Traffic	308 281	501 536	4.5

^{1/} Both directions.

^{2/} OAG data.



2.5.6 Between North America and South America and Central America/Caribbean

2.5.6.1 **Table 8 a)** depicts the development of traffic between North America and South America and Central America/Caribbean over the period 1995-2004 and the forecast to the year 2015. The passenger traffic increased from approximately 35.2 million in 1995 to 47.4 million passengers in 2004 at an average annual growth rate of 3.4 per cent.

2.5.6.2 For the period 2004-2015, passenger traffic is expected to increase at an average annual growth rate of 4.5 per cent, reaching some 77.1 million passengers in the year 2015.

TABLE 8 a)

	Year	Passengers (Million)	Load Factor	Average Seats
Historical	1995	35.23	62.0	189
	2000	43.77	64.0	190
	2001	43.33	67.0	173
	2002	42.00	66.5	172
	2003	41.23	68.0	168
	2004	47.42	70.0	166
Forecast	2015	77.14	70.0	170
Average Annual Growth (Per cent)	1995-2004	3.4	1.4	-1.4
	2004-2015	4.5	0.0	0.2

2.5.6.3 The aircraft movements for the period 2004-2015 are projected to increase at an average annual growth rate of 4.3 per cent, reaching some 878 600 movements in the year 2015, as illustrated in **Table 8 b).**

TABLE 8 b)

Aircraft Movements	
2004* (historic)	553 537
2015 forecast	878 627
Average Annual Growth (Per cent) 2004-2015	4.3

* OAG data

Note: In the Table 8 a) the forecast growth rates for the period 2004-2015 were obtained by using ICAO data reported by Member States and the methodology described in Section 2.1. The final aircraft movements forecast, presented in Table 8 b), however, was produced by applying these growth rates to the actual 2004 OAG data as the base year.

2.5.6.4 Aircraft movement forecasts for the top 25 city pairs within the route group are illustrated in **Table 8 c)**.

TABLE 8 c)

Rank	City Pair	Total Aircraft Movements ^{1/} 2004 ^{2/}	Total Aircraft Movements ^{1/} 2015	Average Annual Growth (Per cent) 2004-2015
1	Nassau - Miami	17 348	28 153	4.5
2	San Juan - New York	14 845	24 091	4.5
3	Nassau - Fort Lauderdale	12 434	20 392	4.6
4	Mexico City - Houston	7 334	12 155	4.7
5	Freeport - Fort Lauderdale	6 929	11 851	5.0
6	Mexico City - Los Angeles	6 616	10 965	4.7
7	Los Angeles - Guadalajara	6 295	10 324	4.6
8	San Juan - Orlando	6 050	9 513	4.2
9	Monterrey - Houston	5 656	8 707	4.0
10	San Jose - Miami	5 532	9 073	4.6
11	Miami - Cancun	5 412	8 600	4.3
12	San Juan - Miami	5 346	8 495	4.3
13	Miami - Mexico City	5 095	8 096	4.3
14	Miami - Caracas	5 048	8 366	4.7
15	Santo Domingo - New York	4 881	7 675	4.2
16	Mexico City - Dallas/Fort Worth	4 652	7 710	4.7
17	Orlando - Nassau	4 354	6 846	4.2
18	Marsh Harbor - Fort Lauderdale	4 333	7 181	4.7
19	West Palm Beach - Nassau	4 313	6 781	4.2
20	San Jose Cabo - Los Angeles	4 278	6 726	4.2
21	New York - Mexico City	4 266	6 708	4.2
22	San Juan - Fort Lauderdale	4 230	6 651	4.2
23	São Paulo - Miami	4 164	6 547	4.2
24	Mexico City - Chicago	4 013	6 651	4.7
25	San Juan - Chicago	3 901	6 005	4.0
	All Other	396 212	624 365	4.2
	Total Traffic	553 537	878 627	4.3

^{1/} Both directions.

^{2/} OAG data.

2.6 Summary of Major Route Group Forecasts

2.6.1 Passenger forecast

2.6.1.1 **Table 9 a)** depicts the summary of the passenger traffic forecasts for the six route groups to, from and within the CAR/SAM Region for the period 2004-2015.

TABLE 9 a)
PASSENGER TRAFFIC FORECAST, 2004-2015

Major Route Group	2004 (millions)	2015 (millions)	Average Annual Growth (%) (2004-2015)
South Atlantic	5.63	9.79	5.2
Mid-Atlantic	6.44	11.10	5.1
Intra-South America	8.03	13.40	4.8
Between South America and Central America/Caribbean	2.69	4.44	4.7
Intra-Central America and Caribbean	3.67	6.08	4.7
Between North America and South America and Central America/Caribbean	47.42	77.14	4.5
Total	73.88	121.95	4.7

2.6.1.2 Overall passenger traffic to, from and within the region is projected to grow at an average annual rate of 4.7 per cent. It is anticipated that the average growth rates for the major route groups will range from a low of 4.5 per cent (North America and South America and Central America/Caribbean) to a high of 5.2 per cent (South Atlantic).