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ECONOMIC COMMISSION

Agenda Item 43: Aviation Data — Monitoring and Analysis

AVIATION DATA: FORECASTING AND ANALYSIS

(Presented by the Council of ICAO)

EXECUTIVE SUMMARY

This working paper reports on activities relating to forecasting and economic analysis, in accordance with Appendix B, C, G and H of Assembly Resolution A37-20: *Consolidated statement of continuing ICAO policies in the air transport field*. ICAO provides Member States, the air transport industry and civil aviation community with up-to-date and reliable aviation data.

Action: The Assembly is invited to:

a) review the information and assessment presented in this paper;
b) endorse the Organization's plan for future work in the field of aviation data as presented in paragraph 4;
c) consider the information contained in this paper for the update of Assembly Resolution A37-20.

Strategic Objectives:	This working paper relates to Strategic Objectives C — *Environmental Protection and Sustainable Development of Air Transport*.
Financial implications:	The activities referred to in this paper will be undertaken subject to the resources available in the 2014–2016 Regular Programme Budget and/or from extra budgetary contributions.
References:	A38-WP/55, Consolidated statement of continuing ICAO policies in the air transport field Doc 10008, *Report of the Economic Commission of the 37th Session of the Assembly* Doc 9970, *Africa-Indian Ocean Regional Traffic Forecasts 2010 – 2030* Doc 9958, *Assembly Resolutions in Force* (as of 8 October 2010) Doc 9956, *Global and Regional 20-Year Forecasts for: Pilots, Maintenance Personnel, Air Traffic Controllers, 2011* Doc 8991, Manual on Air Traffic Forecasting Cir 333, *Global Air Transport Outlook to 2030* (GATO) Report of the Fourth Meeting of the MIDANPIRG Traffic Forecasting Sub-Group (TF SG/4) Report of the Asia/Pacific Area Traffic Forecasting Group (APA/TFG) Sixteenth Meeting Report of the Ninth Meeting of the CAR/SAM Traffic Forecasting Group (CAR/SAM TFG)

1. BACKGROUND

1.1 Aviation data, specifically forecasting data, various air navigation parameters and economic analysis, are useful tools in building trend indicators and planning steps required by the Organization to monitor its performance in achieving its Strategic Objectives. ICAO has been tasked with the collection, processing and dissemination of aviation data in order to allow States to use the data in support of the safe and orderly growth of international civil aviation services that are operated soundly and economically. The users of ICAO's aviation data range from States to air transport stakeholders, academics and consultants.

1.2 The work of the Organization in the field of air traffic forecasting is governed by Appendix C of Assembly Resolution A37-20, *Consolidated statement of continuing ICAO policies in the air transport field.* As forecasts form the basis of effective planning, ICAO forecasts support all Strategic Objectives of the Organization. The provision of aircraft movement forecasts by major route groups and of traffic peak-period analyses for congested airspaces assists the ICAO Planning and Implementation Regional Groups (PIRGs) in managing the increased traffic by adopting timely and appropriate air navigation measures and capacity planning. Such forecasts are also critical to the assessment and the efficiency of aviation operations and of cost-effectiveness of future air navigation systems. Medium and long-term forecasts are equally useful to regional and global environmental analyses and for air navigation services planning. Forecast pertaining to licensed personnel, training and maintenance facility requirements supports planning for improved safety.

2. ICAO'S WORK IN FORECASTING ACTIVITIES

2.1 Medium-term forecasts

2.1.1 Medium-term forecasts are released annually on the ICAO public website. The latest set of forecasts, for the years 2013 to 2015, will be available in the second half of 2013. Global and regional analyses of trends in airline traffic, along with factors underlying air traffic demand over the last decade, were prepared. A summary of the results for 2013 and 2014 is provided in Appendix A. The 2013 forecasts are in line with the preliminary estimates for 2013, according to which world traffic increased by 6.0 per cent compared to 2012 levels.

2.2 Long-term forecasts

2.2.1 The Secretariat has developed a long-term passenger traffic forecast which extends to a 30-year horizon under a bottom-up econometric methodology. A similar approach was used for the development of the air cargo traffic forecasts with directional traffic flows reflecting more accurately the itinerary of freight item. The detailed analyses, methodologies and results were published in the first quarter of 2013 in Circular 333, *Global Air Transport Outlook to 2030* (GATO).

2.3 Passenger traffic forecasts were developed for 53 traffic route groups for scheduled traffic, while total non-scheduled traffic was modelled as a specific sub-market at the global level. Air cargo traffic is categorized differently from its passenger counterpart. It includes cargo carried both in all-freight services as well as in the belly-space of passenger aircraft. The latter type is mainly driven by passenger demand rather than actual cargo-related needs, as it has been widely generated by the frequency of passenger flights. Forecasts by region of airline registratioin are derived from the forecasts established for each route group. The summary of the forecasting results by region of airline registration (i.e. passenger traffic forecasts + cargo traffic forecasts) are provided in Appendix B and Appendix C.

2.4 Licensed personnel forecasts

2.4.1 Over the next twenty years, demand for qualified aviation personnel, such as pilots, aircraft maintenance personnel and air traffic controllers will need to be correlated to aircraft delivery plans. The Next Generation Aviation Professionals Symposium held in Montréal in March 2010 asserted that the air transport industry requires hard data on human resources and training capacities for future planning. In early 2011, the Secretariat published the *Global and Regional 20-Year Forecasts for Pilots, Maintenance Personnel and Air Traffic Controllers* (Doc 9956). This study provides information on the consequences of anticipated traffic and fleet growth on the demand for qualified aviation personnel. Shortages or surpluses in training capacity are quantified with a view to helping States identify potential issues and adapt training infrastructure accordingly.

2.5 Support to other users

2.5.1 Assistance and support were provided in the development of traffic forecasts and other planning parameters required by PIRGs. The input, produced by the Traffic Forecasting Groups (TFGs), is being used by the respective PIRGs for the development of future planning of air navigation services in their respective regions, as well as in conducting peak-period analyses. In 2011, the Africa-Indian Ocean TFG (AFI TFG) and the Middle East Air Navigation PIRG (MIDANPIRG) Traffic Forecast Sub-Group (TF SG) meetings were held and two reports published, respectively the *Africa-Indian Ocean Regional Traffic Forecasts 2010 – 2030* (Doc 9970) and the Fourth Traffic Forecast Sub-Group (*TF SG/4) – Report* (Cairo, Egypt, November 2011). The same support was provided to the Asia/Pacific Area Traffic Forecasting Group (APA TFG) and the Caribbean/South America Region Traffic Forecasting Group (CAR/SAM TFG). The reports of the meetings of these Groups containing Asia/Pacific traffic forecasts for the period 2012-2032, and the Caribbean/South American regional forecast for the period 2011-2031, respectively, were published in 2012. A fifth meeting to update the forecasts for the AFI region will be held in the last quarter of 2013. The TFG reports are available on the ICAO website at http://www.icao.int/sustainability/Pages/eap-fp-regional-traffic-forecasting-groups.aspx.

2.6 The Secretariat has also provided support to the Forecast and Economic Analysis Support Group (FESG) of the Committee on Aviation Environmental Protection (CAEP). This support includes provision of input in terms of aviation data toward the development of global long-term traffic and fleet forecasts for environmental analyses and the review of a global constrained forecasting model for potential use in support of environmental assessment of the potential impact of constraints. The fleet forecasts are developed utilizing a corporate model of Airbus for the passenger fleet forecast while the cargo fleet forecast uses a Boeing model.

2.7 Promotion and dissemination

2.7.1 The revision of the Manual on Air Traffic Forecasting (Doc 8991), taking into account the new ICAO methodology, will be finalized in 2013.

2.8 To support the dissemination of the new ICAO forecasting documents, four hands-on training sessions on statistics were conducted at ICAO Headquarters in 2011 and 2012 providing training in forecasting techniques. In parallel, and in cooperation with CAE[1], ICAO developed a set of air transport e-learning courses on forecasting that will be available in the second half of 2013.

[1] A major international provider for aviation training services

3. ICAO'S WORK IN ECONOMIC ANALYSIS

3.1 Based on Appendix G of Assembly Resolution A37-20, studies on regional differences in international airline operating economics continue to be conducted annually during the triennium under the Revenue Cost Analysis (RCA) system. These studies provide a global, impartial and unique source of data and analyses used regularly by States and international organizations for essential tasks such as analysis of airline operating economics, evaluation of the impact of regulatory change and environmental planning. Notably, the RCA model allows for the estimation of fuel consumption volume for each airline based on a fuel consumption formula specific to each aircraft type.

3.2 Data from these studies are also used by the International Air Transport Association (IATA) for establishing factors to prorate airline revenues from interline journeys. Air traffic and financial airline data analyses were conducted annually in the calculation of a basic airmail conveyance rate by the Universal Postal Union (UPU), applicable to the settlement of accounts with designated operators in respect of airmail conveyance. These two deliverables have generated annual gross revenues of approximately CAD 175 000 for the Organization.

4. FUTURE WORK

4.1 With a view to advancing its Strategic Objectives, the Organization plans to work in the area of aviation data, in the manner presented below.

4.2 In cooperation with all involved stakeholders, ICAO will establish a multi-disciplinary working group to consider the development of an appropriate set of aviation data, including forecasts, taking into account the needs expressed by States, internal users and by the industry. The expected results will help streamline and harmonize aviation data activities within ICAO, thus better utilizing the limited available Secretariat resources**,** and facilitating the provision of accurate, reliable and consistent data required for informed decision-making by States.

4.3 ICAO will undertake relevant measures to ensure widespread awareness and knowledge of its aviation data capabilities and ensure that they remain relevant and responsive to the situation.

4.4 ICAO will conduct studies on regional differences in international airline operating economics and provide deliverables to IATA and UPU.

4.5 ICAO will support as requested, air navigation capacity, planning and efficiency as well as environmental analyses through the development of regional forecasts and other planning parameters by taking into account the need for pooling resources, while maintaining a single harmonized set of ICAO forecasts and aviation data for global and regional use.

4.6 Considering that ICAO's capabilities in aviation data are valuable in supporting the development of results-oriented programmes which enable the monitoring of trends and developments on the basis of independent, accurate and up-to-date aviation data and tools, ICAO will consider implementing a common and open digital space exchange for sharing aviation data, analysis and tools within the Organization as well as with States and the aviation industry at large.

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APPENDIX A

Economic and Passenger Traffic Forecasts

Economic growth (GDP) by region

(Real average annual growth rates)

Region	Preliminary estimates	Forecasts
	2013 (%)	**2014** (%)
Europe	1.8	2.4
Africa	5.6	5.4
Middle East	3.8	4.4
Asia and Pacific	6.3	6.7
North America	2.4	3.3
Latin America/Caribbean	4.1	4.7
World	**4.0**	**4.6**
Source : ICAO estimates based on IHS Global Insight.		

Global and regional scheduled passenger traffic

(Revenue Passenger-Kilometres average annual growth rates)

Region of airline of registration	Preliminary estimates	Forecasts
	2013 (%)	**2014** (%)
Europe	4.4	5.5
Africa	5.2	5.7
Middle East	10.2	11.2
Asia/Pacific	5.5	6.4
North America	2.3	3.3
Latin America/Caribbean	7.6	8.7
World	**4.8**	**5.9**

Source: ICAO, http://www.icao.int/sustainability/pages/eap_fp_forecast_tables.aspx

APPENDIX B

Summary of Passenger Traffic Forecasts by Region of Airline Registration

(Scheduled Services)

Passenger traffic results in terms of RPKs

		AAGR		worldwide distribution	
Region	**Flight Stage**	**1995–2010**	**2011–2030**	**2010**	**2030**
Europe	*Total*	5.4%	3.4%	27%	22%
	International	6.3%	3.4%	38%	31%
	Domestic	2.0%	2.8%	8%	6%
Africa	*Total*	5.7%	4.1%	2%	2%
	International	6.1%	4.0%	3%	3%
	Domestic	3.3%	4.7%	1%	1%
Middle East	*Total*	11.6%	7.6%	7%	13%
	International	12.4%	7.6%	11%	19%
	Domestic	4.2%	7.7%	1%	2%
Asia/Pacific	*Total*	6.2%	6.2%	29%	38%
	International	5.1%	5.8%	28%	31%
	Domestic	8.2%	6.6%	32%	49%
North America	*Total*	2.8%	2.3%	29%	19%
	International	3.6%	2.8%	16%	11%
	Domestic	2.8%	2.1%	52%	33%
Latin America and the Caribbean	*Total*	4.8%	6.1%	5%	6%
	International	2.9%	5.6%	4%	4%
	Domestic	6.3%	6.5%	6%	9%
WORLD	**Total scheduled**	**5.0%**	**4.6%**	**100%**	**100%**
	International	5.7%	4.8%	100%	100%
	Domestic	3.9%	4.4%	100%	100%

Note: Domestic route groups do not include cabotage

Source: ICAO, Cir 333 *Global Air Transport Outlook to 2030*

APPENDIX C

Summary of Total Cargo Traffic Forecasts by Region of Airline Registration

(Scheduled Services)
Cargo traffic results in terms of FTKs

		AAGR		worldwide distribution	
Region	**Flight Stage**	**1995–2010**	**2011–2030**	**2010**	**2030**
Europe	*Total*	2.8%	4.3%	21%	19%
	International	2.9%	4.3%	25%	21%
	Domestic	-0.4%	3.0%	3%	3%
Africa	*Total*	4.3%	3.1%	1%	1%
	International	4.6%	3.1%	2%	1%
	Domestic	-0.9%	1.0%	0%	0%
Middle East	*Total*	10.3%	7.6%	9%	15%
	International	10.4%	7.7%	10%	17%
	Domestic	1.1%	0.8%	0%	0%
Asia/Pacific	*Total*	6.3%	5.7%	43%	44%
	International	6.1%	5.8%	44%	45%
	Domestic	7.6%	5.1%	33%	37%
North America	*Total*	4.1%	4.2%	23%	18%
	International	4.2%	4.2%	16%	13%
	Domestic	4.0%	4.1%	62%	56%
Latin America and the Caribbean	*Total*	2.9%	5.7%	3%	3%
	International	2.5%	5.5%	3%	3%
	Domestic	8.1%	8.0%	2%	3%
WORLD	**Total scheduled**	**5.0%**	**5.3%**	**100%**	**100%**
	International	5.0%	5.4%	100%	100%
	Domestic	4.8%	4.4%	100%	100%

Note: Domestic route groups do not include cabotage

Source: ICAO, Cir 333 *Global Air Transport Outlook to 2030*

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