
Editorial

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The 2010 Air Transport Research Society (ATRS) Conference was held in Porto, Portugal. In its 14th year, the conference attracted 319 participants and 247 paper presentations. The ATRS, a special interest group of the World Conference on Transport Research Society (WCTRS), attracts researchers, policy makers, executives and practitioners from world wide, to share research issues, methodologies and results, to enhance research capability on multinational and multidisciplinary air transport issues, and to find solutions to current and anticipated future challenges.

The theme of the ATRS 2010 Conference in Porto was small and medium airlines' strategy, to reflect on the Portuguese situation. In Portugal, the national airline, TAP, accounted for about 5% of Portuguese total exports in 2010. Between 2006 and 2010, the growth in TAP's RPKs was of 42%. These numbers express that medium-sized airlines do have a place in the market and play a role in growing national economies. This being said the fast growth of the industry does pose future problems in air traffic management.

We have made *advances in air traffic management and regional connectivity* the theme of this ATRS special issue. The air transport industry plays a major role in the world's economic activity and remains one of the fastest growing sectors. Given this, the number of aircraft, in the system, has increased fast and step changes in managing air traffic have become necessary to cope with growth and secure system safety over the next 50 years. Air transport is shaped by the society we live in influencing ATM needs, size, shape and success. Constantly rising demands for lower travel costs, better service quality, sustainability and high safety standards places tough demands on existing air transport systems, not to mention the call for greater integration with other transport modes.

Today ATM is composed of airborne systems and ground-based systems needed for the efficient and safe movement of aircraft. ATM constitutes in its widest sense all activities carried out by aviation authorities for the effective and secure utilisation of airspace and movements within and between regions. The ATM has one principal objective which is facilitating the operator's preferred flight profiles and keep to departure and arrival plans without jeopardising safety. ATM consists of closely integrated procedures and interfaces between an air and a ground system, with the ground component being made up of *air space management* (ASM), *air traffic flow measurement* (ATFM) and *air traffic services* (ATS).

The need to revise the current communications, navigation and surveillance/air traffic management (CNS/ATM) is due to two principal factors:

- 1 the limitations in the current system
- 2 the need for ATS consistency while progressing to a seamless CNS/ATM system.

The global navigation satellite system (GNSS) has played a major role in enabling new future scenarios for ATM and forthcoming technologies are being developed based on the GPS platform. For example, to secure accurate positioning information in support of the non-precision approach (NPA) and the precision approach (PA) in all phases of the flight.

To meet future ATM requirements both Europe and the USA have taken measures to put progressively in place new systems, named SESAR and NextGen respectively. The first step in this direction, in Europe, was the Single European Sky launched by the European Commission: to restructure air traffic according to flows, rather than national borders, to create additional capacity and to increase the ATM overall efficiency. The European Commission's ATM legislative package of four regulations covers the essential regulatory elements to be developed in order to achieve a seamless European air traffic management system. They are:

- 1 a framework for the creation of the single European sky
- 2 the provision of air navigation services
- 3 the organisation and use of airspace
- 4 the interoperability of the European air traffic management network.

Following the accession of the European Community (EC) to EUROCONTROL, the EU central ATM body, in October 2002, the EC has the same rights and obligations as any member state. As a consequence, EUROCONTROL and the EC signed a memorandum of cooperation to enhance their synergy in five areas of cooperation:

- 1 implementation of the single European sky
- 2 research and development
- 3 GNSSs, including Galileo
- 4 data collection and analysis in the areas of air traffic and environmental issues
- 5 international cooperation in the field of aviation.

The various stakeholders have recognised that more research is needed into all aspects of air traffic management: technological, operational, economic, managerial and strategic. This poses not only a critical concern for the various stakeholders but also an opportunity. To this effect the SESAR project brings all the European ATM stakeholders together towards a common vision of the future European ATM system. With SESAR it is hoped that the fragmented approach to research will be consolidated to provide for the necessary leap required to bring ATM into the future.

Five papers have been selected for this issue of the *International Journal of Aviation Management*, based on a double blind reviewing process. Although, the ATRS Porto Conference covered a wide range of topic areas, we chose for the ATRS special issue presented here, three papers that focus on advances in air traffic management and two papers that deal with airport planning and small aircraft accessibility.

The specific topics range from air traffic flow management (ATFM), the advanced ADB-S air traffic management concept, RNAV and RNP approach systems, a new urban planning regime for privatised airports in Australia and the use of small aircraft in Spain.

In their paper, Crespo, Weigang and de Barros stress the importance of air traffic flow management (ATFM) for the airspace control system, due to two factors: first, the impact of ATFM on air traffic control, including inherent safety implications on air operations; second, the possible consequences of ATFM measures on airport operations. Thus, they argue that it is imperative to establish procedures and develop systems that help traffic flow managers to take optimal actions. In this context, their work presents a comparative study of ATFM measures generated by a computational agent based on artificial intelligence (reinforcement learning). The goal of the agent is to establish delays upon takeoff schedules of aircraft departing from certain terminal areas so as to avoid congestion or saturation in the air traffic control sectors due to a possible imbalance between demand and capacity. The paper includes a case study comparing the ATFM measures generated by the agent autonomously and measures generated taking into account the experience of human traffic flow managers. The experiments showed satisfactory results.

Rodrigues, Silva and Bousson analyse the impact of advanced air traffic management technologies, in particular ADS-B over ATM concepts for the case of Portugal. Their paper begins with some remarks about ADS-B technology, precisely to introduce the case study of Azores Archipelago within Santa Maria FIR, in Portugal. On the basis of real scenarios of Pescara, Trabzon and Rhodes, and using EMOSIA model, a study is conducted to understand costs and return on investment on such equipment in Azores area. Finally, the paper concludes with some highlights of future research.

Medeiros, Silva and Bousson deal with the viability analysis of the implementation of RNAV and RNP-AR approaches to Pico Island airport in the Azorean archipelago. The main objective is to prove that this new type of approach technology can be implemented in the Azorean islands airports in accordance with the ICAO rules providing an increase in safety and lowering approach minima thus reducing the costs associated with the operation and maintenance of the traditional approach systems.

Freestone considers in his paper the urban planning implications through the lens of the Australian experience. While most jurisdictions maintain planning systems regardless of airport ownership, privatisation of approximately 20 airports owned and operated by the Australian government saw the institution of a new planning approvals regime. While this reform introduced more demanding environmental requirements, it sits outside state and local government regulations which control most land use planning in Australian cities. The paper canvasses the tensions which have arisen and pathways to their resolution.

Romero, Palacios and Tafur focus in their paper on the potential growth of the personal aviation market in Spain and its regions and the possible use of small aircraft as an alternative to other transportation modes in Spanish society. The research is mainly based on the secondary data of a survey (Movilia) from the Spanish Ministry of Public Works and Transport.

We hope our readers, whether from industry or academia, find the articles valuable and encouraging to undertake further investigation into the respective topics introduced in this ATRS special issue. We, the editors, would like to take this opportunity to extend our appreciation to the people that contributed to the ATRS Conference 2010 in Porto and the numerous reviewers for this *IJAM* ATRS special issue.