



Agenda Item 6: Other business

**ICAO DATA-DRIVEN AIR TRAFFIC ANALYSIS PROJECT
UNDER THE BIG DATA PROGRAM**

(Presented by the Secretariat)

SUMMARY	
This working paper is intended to present the meeting information on the project for the data collection and analysis on air traffic (ICAO iSTAR Application) aiming to assist planners to identify issues which may impact the capacity, efficiency and safety in air space management and operations.	
References:	
<ul style="list-style-type: none">Seventeenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/17) Lima, Peru, 9 to 13 May 2016	
Strategic objectives	<i>A - Safety B - Air navigation capacity and efficiency E - Environmental protection</i>

1. Introduction

1.1 The Manual on Global Performance of the Air Navigation System (Doc. 9883) establishes that one of the basic principles of the performance-based approach is the decision-making based on facts and data. Its foundation is “*if it cannot be measured, it cannot be managed*”. That is, unless you measure something, it cannot be known whether it is getting better or worse. The analysis of air traffic behaviour in some airspace segments can help to “measure” and to provide relevant information to identify opportunities for improvement in the implementation of measures towards airspace optimization, capacity increase, safety strengthening and emissions reduction, among other advantages.

1.2 To derive information on the behavior of air traffic and its further analysis, it is necessary to develop and implement tools which enable the real time collection of data to the maximum extent possible.

1.3 Several States have their own surveillance sources / data for the different phases of flight for their respective airspaces, including various radar and Automatic Dependent Surveillance Broadcast (ADS-B). Since 2011 there are commercial companies collecting ADS-B data for various purposes, such as providing updates on scheduled flight progress to the public. This data is provided by air navigation service providers and governed

through specific agreements with those companies. Increased sharing and exchange of such information is beneficial to the overall analysis of data. Availability and quality of ADS-B data gathered through ground based receivers depends on the data quality from the transmitter and GNSS on board the airplanes and the number, placement, and availability of ground receivers.

1.4 ICAO started using ADS-B data in 2014 for the initial purpose of analysing traffic volumes at high density airports. Since then, it continued to develop and refine algorithms, creating applications based on such data and making them available to users on the integrated Safety Trend Analysis and Reporting System (iSTARS).

1.5 Most recent applications include the traffic analysis in conflict zones (and any other defined airspace) by providing information on the volume of re-routed traffic and the associated increase in flight sector distance and inferred fuel cost. The algorithms used in determining real time and approximated flight tracks are also used in the analysis related to the effective usage of navigation procedures around airports. Where appropriate coverage is available, the data supports calculation of traffic volume using a specific existing terminal navigation procedure and density distribution in the respective airspace. Presently, the development of solutions is limited to Europe, North America and parts of Asia for reasons of data availability. However, the applications developed can easily be applied to other regions when sufficient ADS-B coverage becomes available and a reasonable percentage of the fleet is equipped with ADS-B system.

2. Discussion

2.1 Under the framework of the ICAO “Big Data Program”, ICAO launched a data-driven air traffic analysis project, under which it conducted an ADS-B coverage analysis at specific airports and recognized that the establishment of a denser ground based receiver network in the CAR/SAM Regions is required for the appropriate availability of data to conduct meaningful analysis. This would be essential not only for ICAO but also for States since those outcomes will improve the level of understanding of air traffic behavior in the Region and provide knowledge to implement appropriate measures to improve capacity, efficiency and safety.

2.2 ICAO encourages States to participate in the data-driven air traffic analysis project and share the appropriate data with ICAO through all means available, including ADS-B networks and Multilateralism. This will allow the establishment of an adequate ICAO data source to derive traffic information and conduct analysis of such. In a second phase, the use of automated tools for the analysis of air traffic at airports with complex operating environment is proposed. A presentation of the “Big Data Program” is available on the website.

2.3 For further information on this Project, States may contact for the CAR States: Ms. Mie Utsunomiya, Regional Officer, CNS, (mutsunomiya@icao.int) and for the SAM States: Mr. Roberto Sosa, ANS & SFTY Regional Officer (rsosa@icao.int). SAM Office will be articulating this initiative with Headquarters.

3. Suggested action:

3.1 Based on the information contained in this working paper, the Meeting is invited to consider the participation of CAR/SAM States in the ICAO “Big Data Program” through the corresponding Regional Office.