SESAR JOINT UNDERTAKING

ADSCENSIO

4D Skyways

WP3 - Contribution of Data Analysis to Project Report

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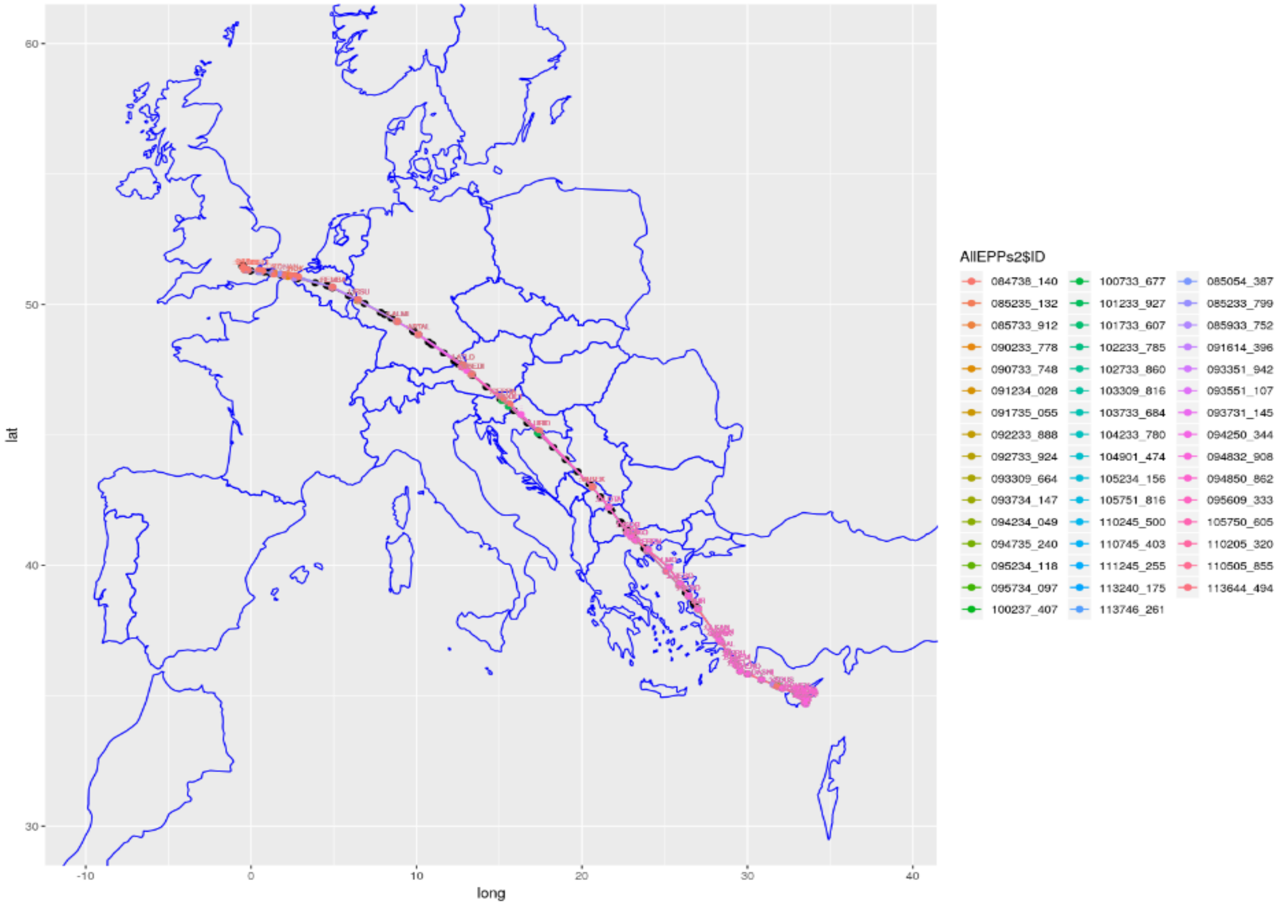
The WP3 has been structured in D3.1 focussing on three main objectives:

1. ***Technical data analysis***, to analyse the performances of ADS-C data exchange from a technical perspective
2. ***Operational data analysis***, to analyse characteristics and the behaviour of ADS-C data contents from an operational perspective
3. ***Common analysis platform***, to support the common data analysis developing a common platform

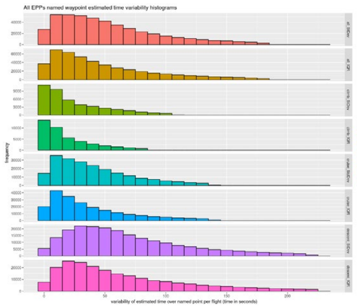


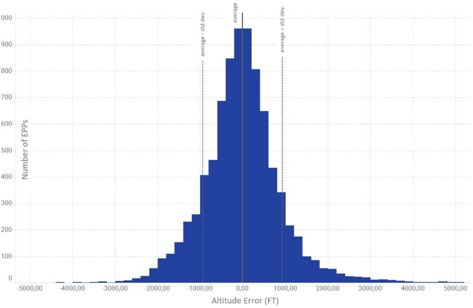
The analyses performed by the ADSCENSIO partners aim to provide input to deployment by:

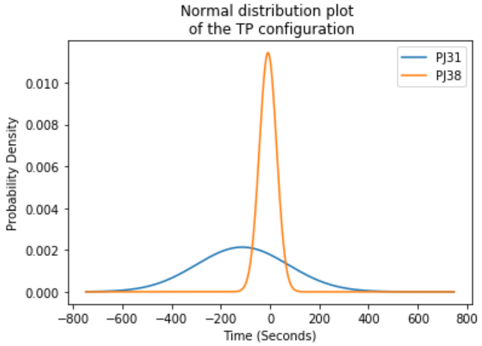
- Collecting inputs for potential standard amendments
- Providing data to support business development

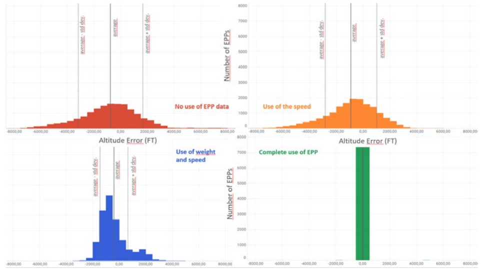
Operational Analysis - Task 3.2

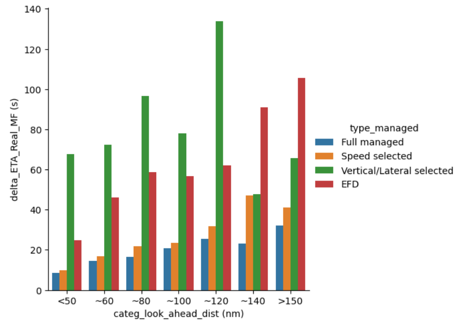
- EPP Variability
- Accuracy of EPP in Climb and Descent
- Ground Trajectory Prediction enhancement using EPP:
  - Comparison of EPP against Ground Trajectory predictions using alternative baseline BADA model
  - EPP use in Trajectory Prediction during Climb and Descent Phases
  - Comparison of conflict detection tools using Trajectory Prediction enhanced with EPP
- Trajectory intent Status and Top of Descent Analysis
- EPP derived Final Approach Speed analysis
- Exploration of Ground Vector, Air Vector and Met-info groups











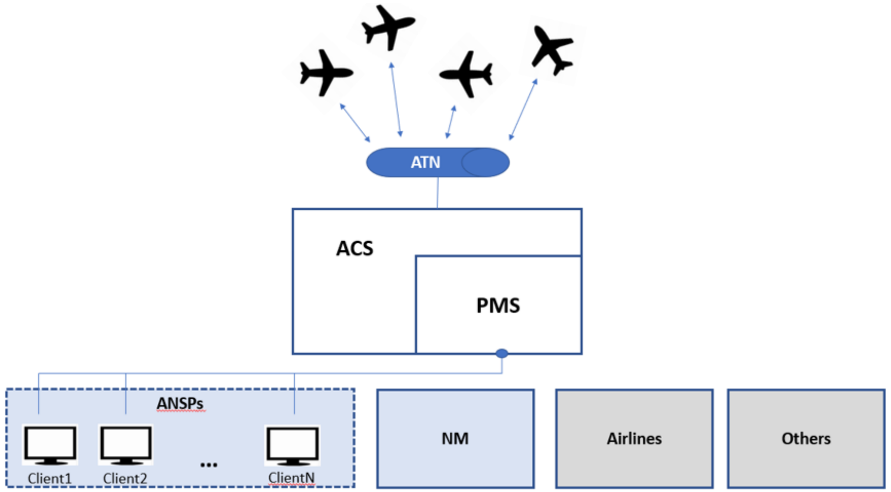
Task 3.2 Operational Analysis Conclusions

Although necessary ATC interventions make definitive conclusions of EPP accuracy analysis challenging, the key high-level observations from this task are:

- Predictability of EPP estimates, particularly for Top Of Descent is improved if the flight is in Fully Managed mode
- Speed Selected mode can also reduce the distance error for EPP estimates over metering fixes
- Ground-based TP and CD&R tool accuracy, can be improved using the ATS-B2 ADS-C elements of; Mass, EPP and Speed Schedule
- Identifying the energy state of aircraft based on the EPP derived Theoretical Descent Profile has the potential to facilitate an optimal stabilised descent.
- EPP can provide a good (< 5Knts error) estimate of the Final Approach Speed at runway threshold upto an hour before touchdown
- Ground Vector, Air Vector and Met Info data groups compare well with Met Forecast data and have potential to be used as an additional source of wind and temperature measurements.

Common analysis platform - Task 3.3

- **Methodology** for the development of a **common analysis platform** based on the most relevant ADS-C metrics to be managed and monitored.
- **High-level architecture** of ADS-C common analysis platform called **ACS PMS** (ADS-C Common Service Performance Management System). Based on two main components:
  - **"Static"** component developed with a client-server architecture focused on ADS-C/EPP technical performance and their compliance with applicable standards and SLA.
  - **"Dynamic"** component based on a distributed architecture which could allow, in the future, to improve other ATM functionalities using ADS-C/EPP data.



- **Methodology** to help **converting flight improvements due to ADS-C into fuel /CO2 values**.
  - **Lateral path:** minimum air distance (ground distance and the weather conditions)
  - **Vertical path:** more optimized altitudes and speeds (aircraft configuration and weather conditions)

Task 3.3 - Common analysis platform conclusions and recommendation

- **ADS-C metrics** to be managed have been classified in the following groups:
  - essential metrics to control the service and associated flights performance;
  - optional metrics to eventually perform post processing calculations;
  - other metrics which would not add additional operational value.

- **ACS PMS** could consist at a first stage of a “static” common system, potentially complemented in the future with a “dynamic” PMS which needs further R&D activities.

- **“Static” ACS PMS** could perform metrics analysis to provide feedback and control on the ADS-C service itself and associated flights. It might be conceived as a common and unique ACS PMS collecting all information and from where the different ANSPs can access for the appropriate geographical control and responsibility.

- **“Dynamic” ACS PMS**, based on distributed architecture, could take advantage of all ADS-C potentiality in order to help the ATCOs to better approach tactical decisions and enable to better tailor the flights in consequence of any occurrence (quicker decisions and increased performances).

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