

Predictability and Flexibility in ATM

InterFAB Research Workshop
Zagreb, 18–19 April 2024

- FAB Central Europe and FAB Europe Central organised the research workshop on 18–19 April 2024 hosted by Croatia Control in Zagreb. The conference was held in partnership with the University of Zagreb and the German Aviation Research Society (GARS).
- About 130 participants from: Universities, institutes, PRB, States, NSAs, airspace users, ANSPs, trade unions, and industry. Delegates from: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, France, Germany, Greece, Hungary, Italy, Lithuania, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, UK.
- Workshop context provided by Director General Croatia Control Mario Kunovec-Varga; Director DGCA France Damien Cazé; Director DGCA Croatia Dinko Stančić, Director General EUROCONTROL Raúl Medina Caballero.

Key Messages

- The world is becoming more and more volatile (e.g., due to geopolitical developments). This leads to less and less accuracy of traffic forecasts and increases at the same time the need to plan carefully.
- There are metrics for the accuracy of traffic forecasts which should be used as they show the likely accuracy error and thus provide additional information.
- Inaccurate traffic forecasts and increasing traffic volatility have an impact on performance: delays, ATCO productivity and environmental efficiency. They lead to an under- or overutilisation of resources.
- ANSPs are coping with increased uncertainty by different means: improving traffic forecasts for their purposes also using AI, increase flexibility of the shift-roster, manage traffic on certain city pairs and better management of ATCOs on the day of action.
- Traffic predictions should be done in a very transparent way enabling the community to analyse the methodological implications of earlier forecasts and hence to further improve them.
- Predictability and flexibility can be dealt with both at the strategic and tactical level. A prerequisite is that all actors disclose all of the information, especially airspace users. The earlier intentions are known the better the airspace can be managed. It could be shown that all interests could be combined at the strategic and tactical level leading to a considerable improvement for both airspace users and ANSPs as only minor adjustments were needed.
- Case study shows that re-routings lead to lower predictability. However, causes for re-routings are mainly fuel prices and only to a minor extent the differences of ATC charges. A benefit of higher fuel prices is better environmental performance and less traffic volatility.
- Lessons learnt from other industries show that flexibility has also a cost and there is a trade-off with its benefits. Regulation needs to allow buffers enabling ANSPs to manage the unexpected. This may lead to overall lower total economic costs.
- Current economic regulation gives very limited manoeuvring area for decision-makers and provide very limited incentives to improve.



- ATM seems to be an industry with diseconomies of scale. Current traffic risk sharing mechanism does not reflect this.
- ATM/CNS can be financed by users or by the general public. The European scheme has the user-pay principle which has worked well over the last decades.