

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 and 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. Scenario planning may help, but they need coordination as regional needs may vary from more global needs. Network Manager plays an important role to balance demand in peak times and to coordinate between airspace users and ANSPs.
- 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. However, it remains a challenge to ensure safety at all times while dealing with increasing traffic volatility and predictions with lower accuracy.
- 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.
- Flexibility has a cost – the lack of flexibility also. The costs and its benefits vary depending on the organization and whether analyzed in the short or long term and could be reflected in an incentive regulation – currently this is only covered indirectly. Explicitly it is included in the current regulation only in the cost-efficiency domain. However, cost elasticity of individual ANSPs to traffic is not considered.
- Economic regulation should consider interdependency of key performance areas. Performance Scheme could improve.
- Predictability and flexibility can be dealt with both at the strategic and tactical level. A prerequisite is that all actors disclose all information. 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 are needed.

- Case studies show 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. Business Models of airlines seem to have a higher impact on traffic volatility than ATC charges. Benefit of higher fuel prices is better environmental performance and less traffic volatility.
- Lessons learnt from other industries show that flexibility has 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 in some cases might be subject to diseconomies of scale. Current traffic risk sharing mechanism does not reflect this and it is difficult to finance future capacity needs.
- 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.
- Functional Airspace Blocks as along with the InterFAB initiative remain integral pillars of the Single European Sky. Functional Airspace Blocks serve as pivotal platforms for convening high-level stakeholders to find innovative ways to address immediate challenges and shape the vision of the European Single Sky into a tangible reality.
- Performance of ATM/CNS should be measured by means of its contribution to GDP and how it fosters social cohesion and its contribution to a sustainable planet. Performance of ATM/CNS should be seen in a holistic way as one of the elements of the whole value chain which includes airspace users and airports as partners.