

# Expert TALKS



## Cost of delay



**Presentation by:**

**Giuseppe Antonio Gangemi**, ENAV Head of Performance Analysis, and moderated by Ibon Galarraga, Research Professor at the Basque Centre for Climate Change



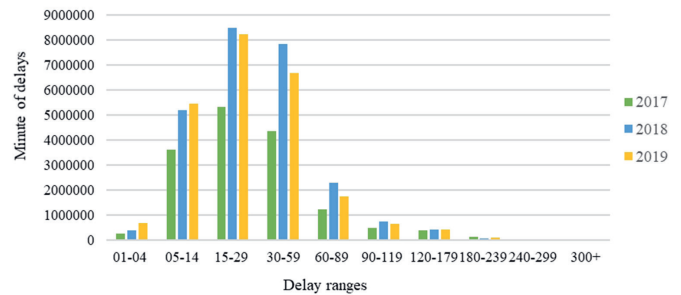
The third InterFAB Expert Talk, hosted by FABEC on 20 April 2021, identified inaccuracies in the calculation of the cost of delay arising from the use of outdated methodology developed in Europe nearly 20 years ago. The results of a simulated exercise were presented to assess more accurately the cost of Air Traffic Flow Management (ATFM) delay. Compiling reliable performance data enables airlines, air navigation service providers (ANSPs) and political decision-makers to plan capacity and resources more effectively in response to demand.

Giuseppe Antonio Gangemi, Head of Performance Analysis for the Italian air navigation service provider (ANSP) ENAV, shared the results of a study conducted by ENAV using the new methodology. Taking all the ECAC flight data from 2012 to 2019, ENAV analysed delay distribution and duration to calculate the cost per minute for different classes of delay. The analysis identified an error of aggregation in the current calculation of the cost of delay of 12.9 percent, resulting in a difference of 860 million euros for the years from 2017 to 2019.

The reason for this difference is that in official publications such as the Performance Review Report (PRR) and Air Traffic Cost Effectiveness (ACE) report, an average value of 102 euro per minute of ATFM delay, irrespective of the length of the delay, is considered. This value is based on the most recent update (2018) of the University of Westminster Transport Studies Group analysis (2003). Post-operational data shows that most of the ATFM delay is less than 30 minutes – showing the usage of the average value does not reflect the real value of delay cost.

### Delayed flight distribution using Post-OPS Data

#### Distribution of flights across the delay ranges



Source: own elaboration based on EUROCONTROL data



The use of an average value for the cost of one minute of delay tends to potentially coat the real value of the delay cost.

	2019	Average	3 ranges	Var (%)	10 ranges	Var (%)
Baltic		26.865.678	17.542.992	-34,7%	15.678.144	-41,6%
Blue Med		195.498.810	199.126.984	1,9%	185.379.881	-5,2%
Danish-Swedish		12.941.454	13.517.068	4,4%	12.768.655	-1,3%
Danube		9.781.698	6.966.963	-28,8%	6.391.474	-34,7%
FAB CE		447.012.348	370.221.921	-17,2%	339.890.275	-24,0%
Fabec		1.244.319.318	1.132.220.437	-9,0%	1.039.111.985	-16,5%
NEFAB		8.375.424	6.441.663	-23,1%	6.133.197	-26,8%
SW_FAB		287.103.786	270.627.464	-5,7%	249.526.304	-13,1%
UK-IR_FAB		169.715.658	173.504.950	2,2%	157.806.328	-7,0%
NOT_A_FAB		55.028.184	55.280.343	0,5%	51.750.973	-6,0%
TOTAL FABs		2.456.642.358	2.245.450.785	-8,6%	2.064.437.216	-16,0%



**Using an average value is a valid approximation for pre-operational decision making, but when assessing the level of performance in the post-operations phase, a more accurate calculation for the cost of delay has to be used to avoid biased calculations**

said Giuseppe Gangemi



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Delay is not easy to understand and takes different forms. For example, schedule buffers may be applied to compensate for tactical delay such as strong headwind and secondary delay can arise as a result of late arrival from a previous flight. Different types of delay have different cost values; for example, allocating delay on the ground is cheaper and safer than once airborne. Single-flight cost data would provide more accurate analysis, but airline sensitivity means these data cannot be analysed.

“ **Delays cost millions of euros for airlines and passengers, therefore a better measurement of timekeeping performance at several points can allow the identification and mitigation of inefficiencies** ”

said Giuseppe Gangemi.

The advantage of the new indicator is to override limitations of current methodology that considers only departure delay and does not consider the overarching objective of a punctual arrival. ENAV applied the new adjusted indicator in a simulation using a selection of flights operating in BLUE MED skies (airspace of Cyprus, Greece, Italy and Malta which together accounted for about 12% of total

ECAC flights) between 2012 and 2020. The results showed a 10% reduction in the cost of delay when the difference between actual in-flight time and estimated flight duration was considered, equivalent to approximately 4.7 million euros per year.

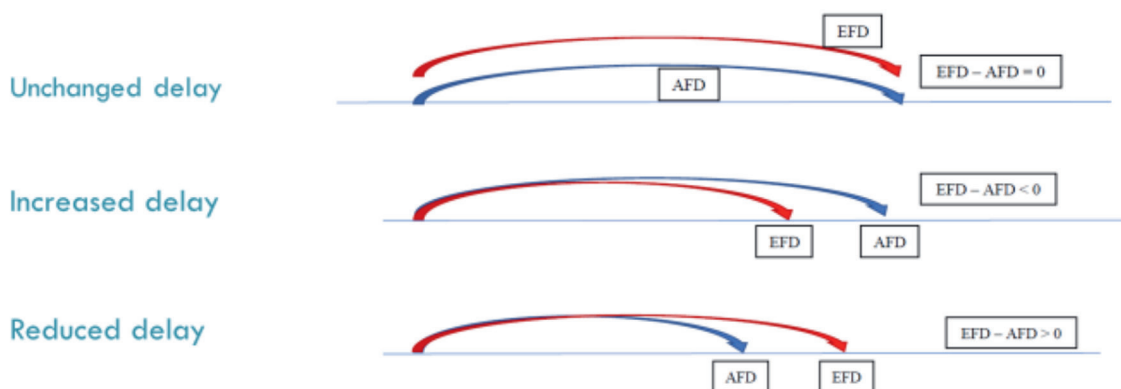
“ **The aim of the research is not to reinvent the wheel rather to further improve the quality of services based on a better understanding. In this light we have assessed more accurately the cost of ATFM delay in Europe to gain a deeper understanding of the actual delay distribution between 2012 and 2019** ”

said Giuseppe Gangemi.

The Expert Talk was attended by more than 70 delegates from all over Europe and generated detailed discussion about different methodologies used to assess the cost of ATFM delay. Highlighting the importance of ATM performance monitoring and measurement, participants learned of the availability of disclosed data and recognised the need for more detailed research to be carried out to improve the calculation of ATFM delay.

## Adjusted delay: Methodology

Compare the **Actual Flight Duration (AFD)** of each flight against its **Estimated Flight duration (EFD)**.  
Depending on the result, the initial (ATFM) delay can be:



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