

Increasing Automation in ATM and Airport Operations

- Insights from SESAR Exploratory Research Projects ARTIMATION and AEON

CONTEXT AND OBJECTIVES

Nowadays automation is being introduced more and more to help Air Traffic Controllers in **reducing their stress and workload** whilst performing their usual activities, so as **to meet the needed safety standards**.

Two SJU-funded projects aim to support ATC activities from two different perspectives:

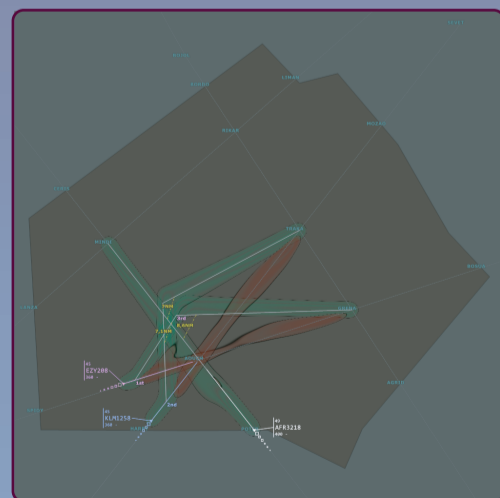
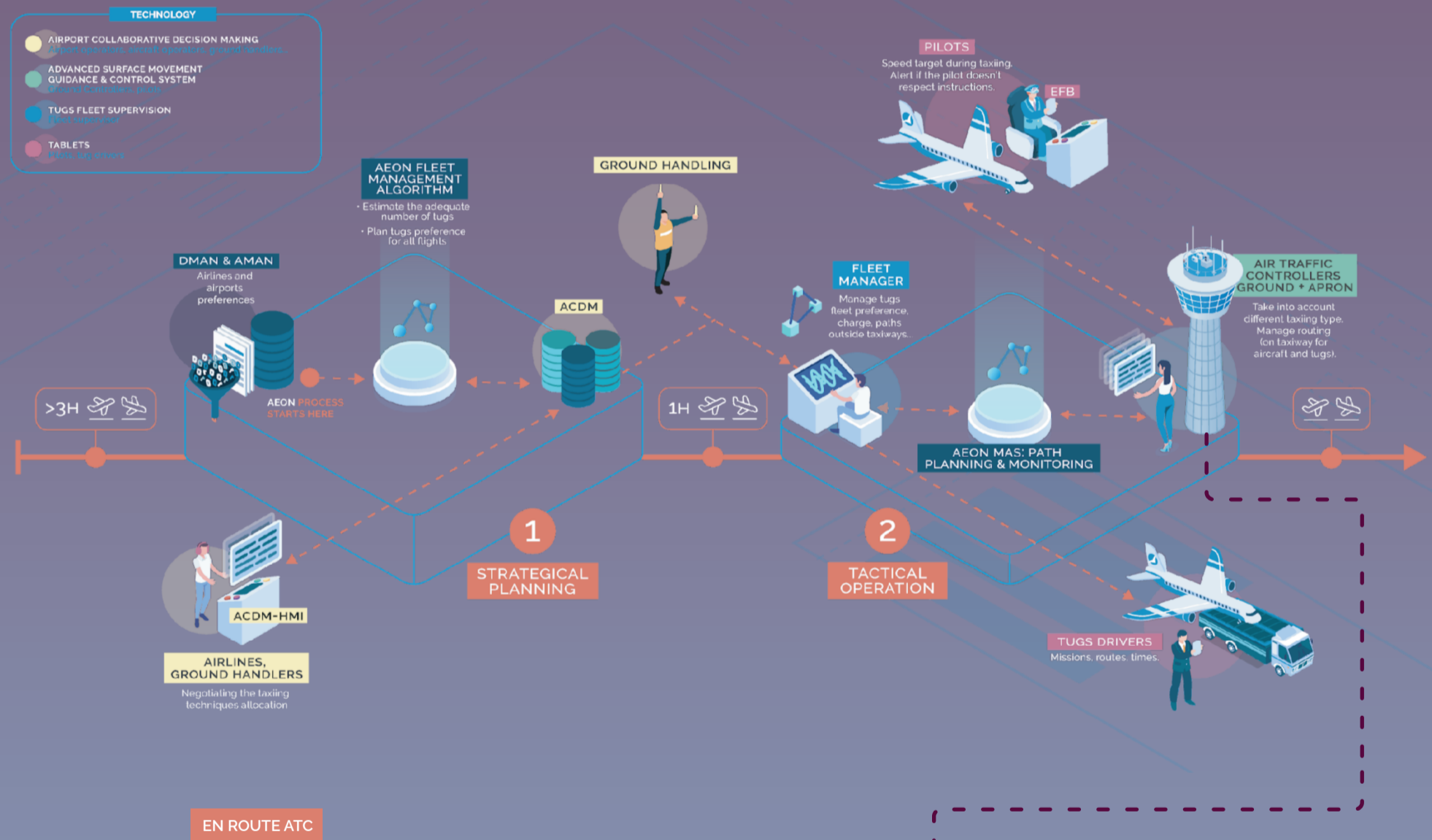
- the ARTIMATION project aims at **providing transparency to AI outcomes** by testing two kinds of explanations based on a human-centered approach
- the AEON project proposes a **novel concept of operations for sustainable airport ground operations** to cope with the additional vehicles on the ground.

At en-route phase, **ARTIMATION provides explainability through visual analytics solutions to support conflict resolution**. On the airport side, an innovative concept of engine-off taxiing operations is proposed by AEON to **reduce fuel consumption and emissions**. Algorithmic explanation is then used to optimise **runway usage** providing predicted delays of the aircraft based on the automatic selections of different parameters.

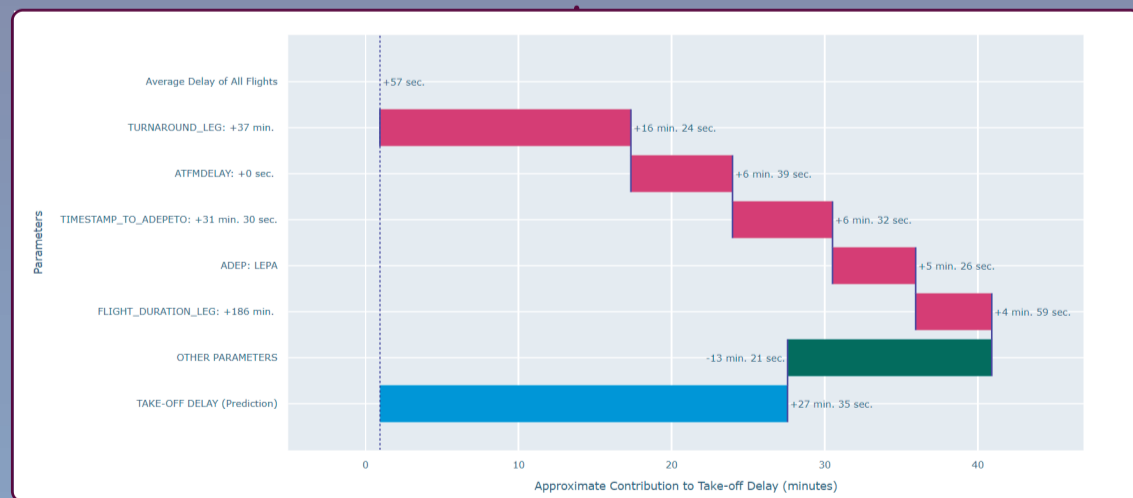
OUTCOMES

AEON developed a set of tools to **foster the usage of different taxiing techniques** (i.e., Tug Vehicles, E-Taxi, and Single Engine Taxiing).

ARTIMATION assessed trust and acceptance of **three different levels of algorithmic explanations of a predicted delay**, depending on the importance of the selected parameters to the final scope of operations. Then, it provided three **visual explanations of the AI outcome** for conflict resolution.



Conflict resolution - Heatmap solution - ARTIMATION



Delay prediction and propagation ARTIMATION

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