

INTER-OPERATING SUPPORTING TOOLS FOR GREEN TAXIING OPERATIONS



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CONTEXT AND OBJECTIVES

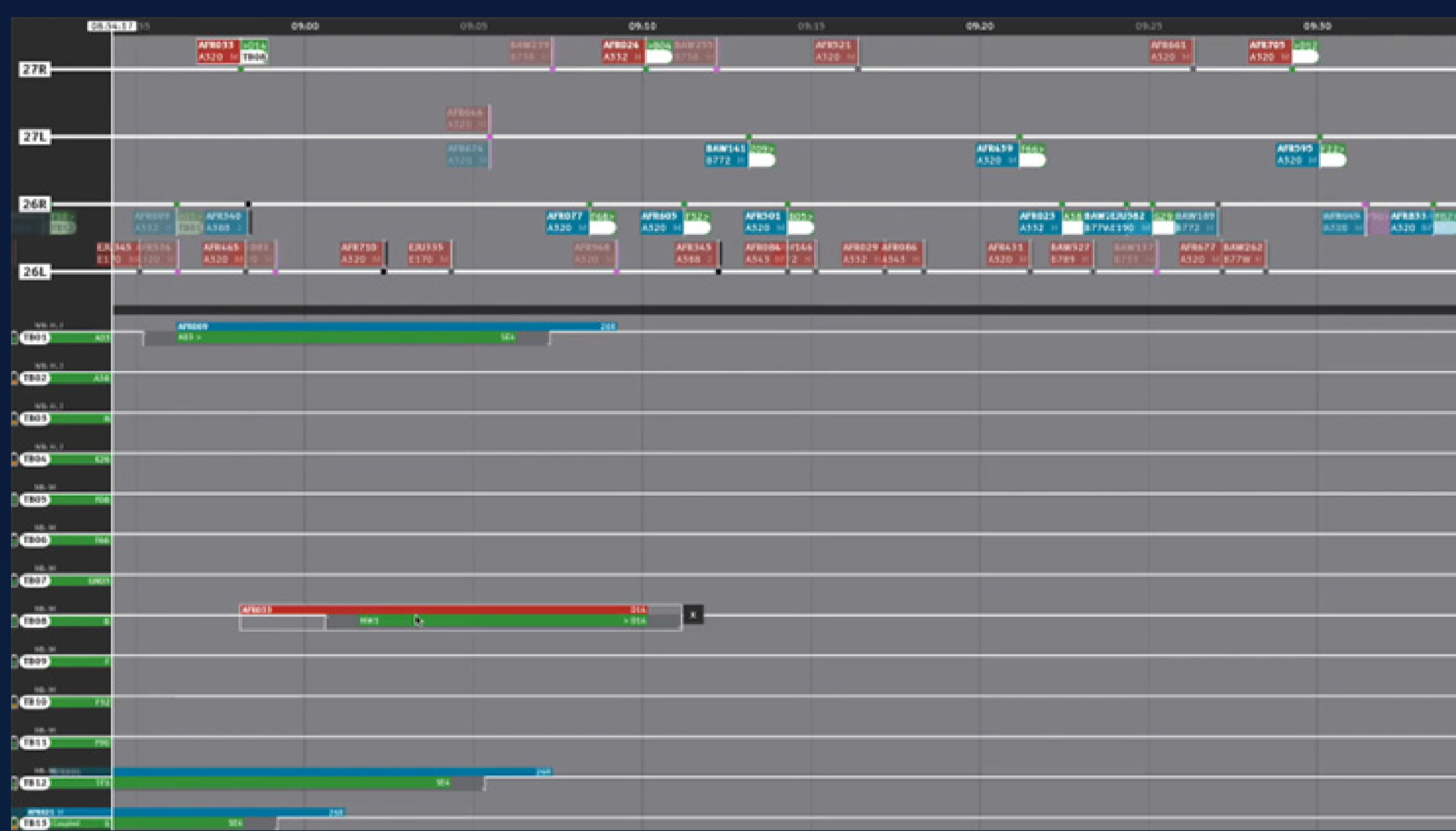
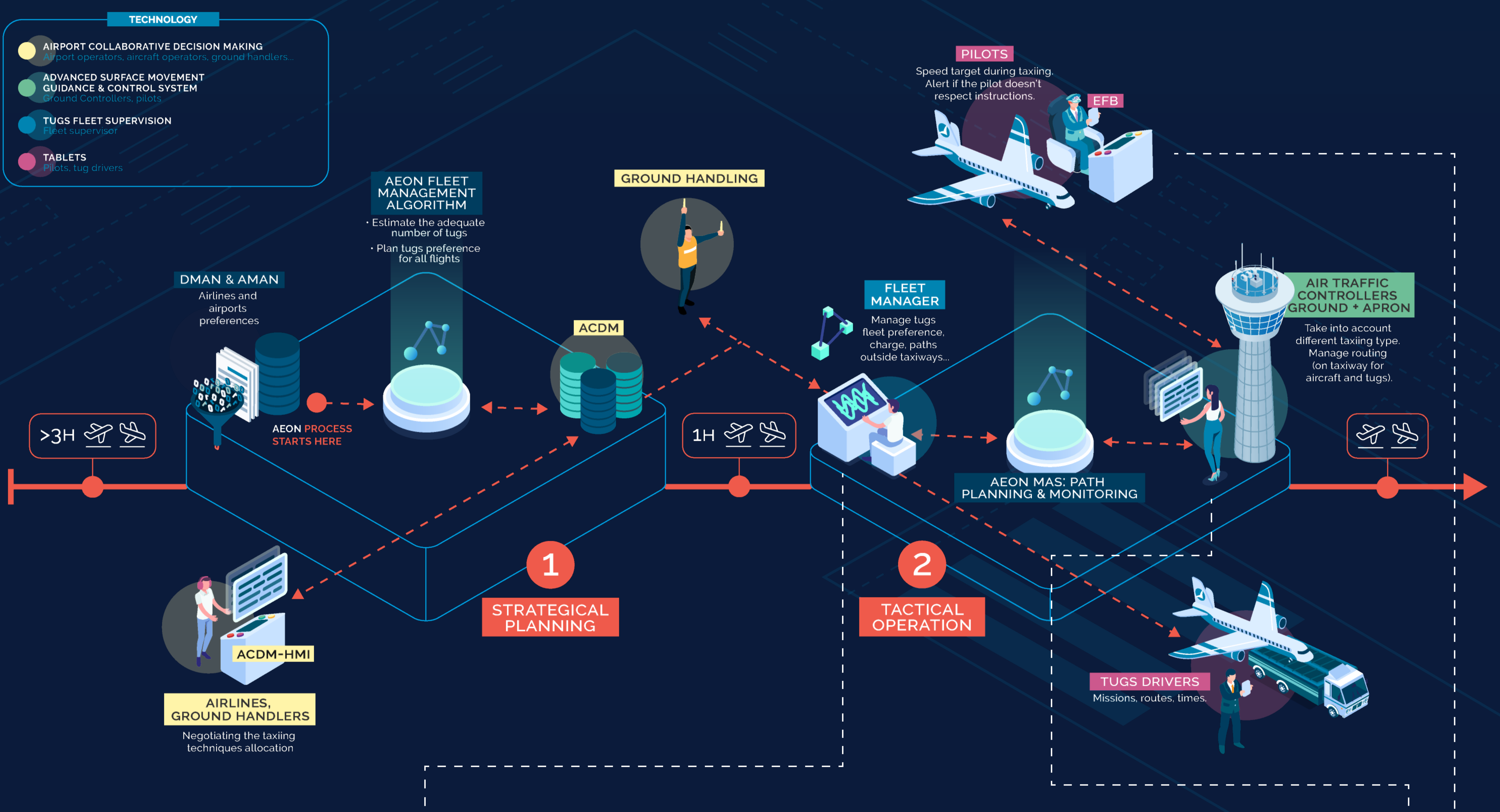
Aircraft jet engines are made for flying, not taxiing. Using main engines for ground operations is inefficient and taxiing phase can represent from 10 to 30% of flight time in Europe (Deonandan et al. 2010). **Two main categories of solutions are being developed** to reduce fuel consumption and noxious emissions during ground operations: autonomous and non-autonomous techniques (respectively electric engines on landing gears or SET and hybrid towing vehicles).

SCIENTIFIC CHALLENGES

The AEON project proposes a novel concept of operation and new supporting tools for sustainable airport ground operations **to cope with the additional vehicles** on the ground. Two tools to support the deployment of ground vehicles into the airport system were developed during the project:

- At the long/medium-term planning phase, a **tool integrated in the A-CDM** supports **discussion and negotiation of the desired taxi technique** for the aircraft.
- At the execution phase, a **multi-agent system integrated in the A-SMGCS** suggests **optimal routes for tugs and aircraft**, using flight plans and surveillance data to compute routes and speed profiles to avoid conflicts and stop-and-go at intersections.

These tools are associated with dedicated Human Machine Interfaces (HMIs) for the new Tug Fleet Manager, the ATC, and Pilots.



An HMI supports the new Tug Fleet Manager role in (re)allocating tugs to aircraft considering arrival and departure sequences.

A-SMGCS HMI is completed with information on the taxi techniques and the routing service is updated accordingly.



The new routing service also calculates speed profiles for aircraft pilots to smooth the flows.

