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SESAR Airspace Users Workshop

Network Collaborative Management

Gérard Mavoian
SESAR solution leader
07th November 2019

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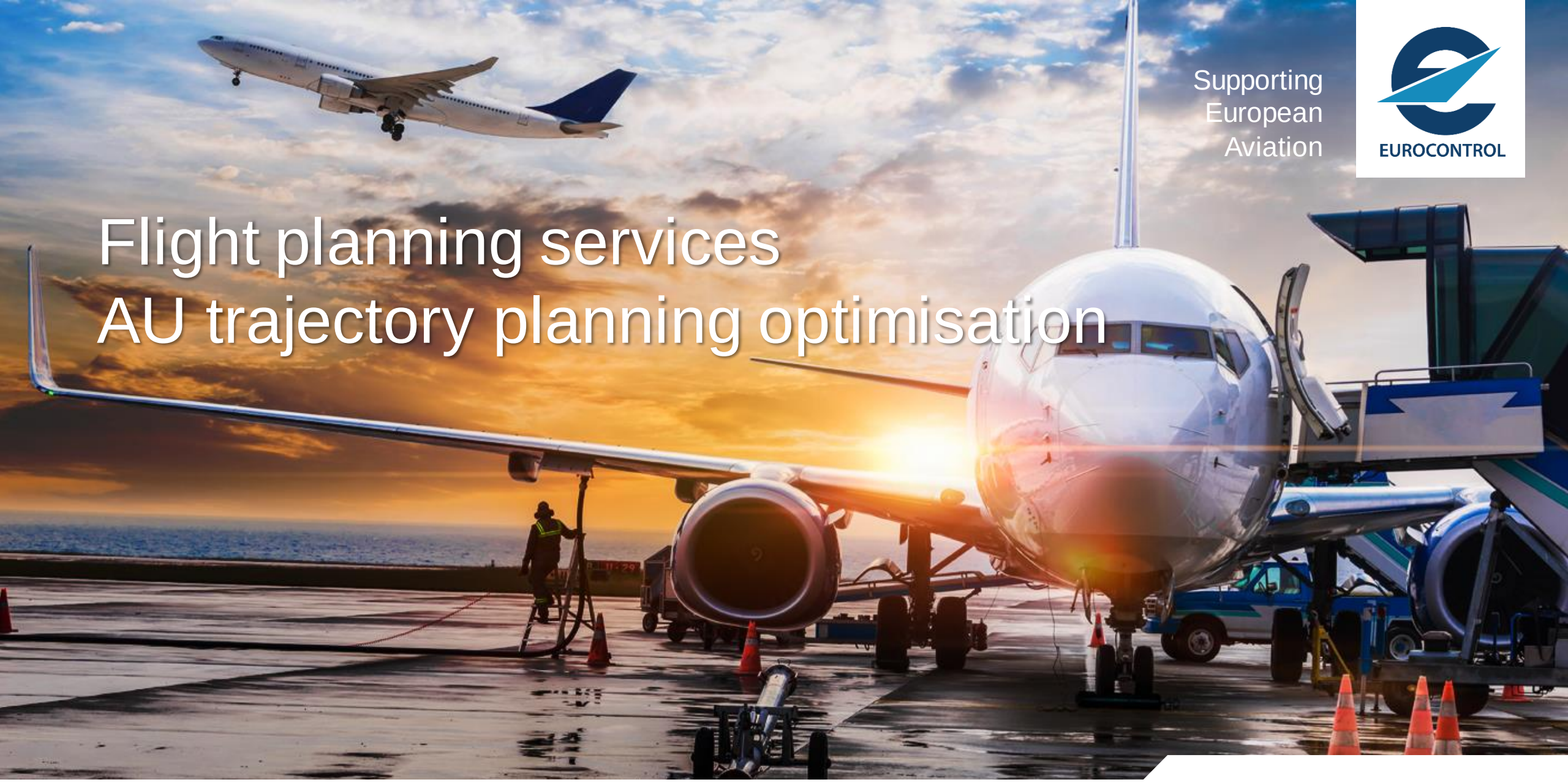
NETWORK MANAGER



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Flight planning services
AU trajectory planning optimisation

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Improving flight planning/DCB/airport integration

PJ07 0AU0

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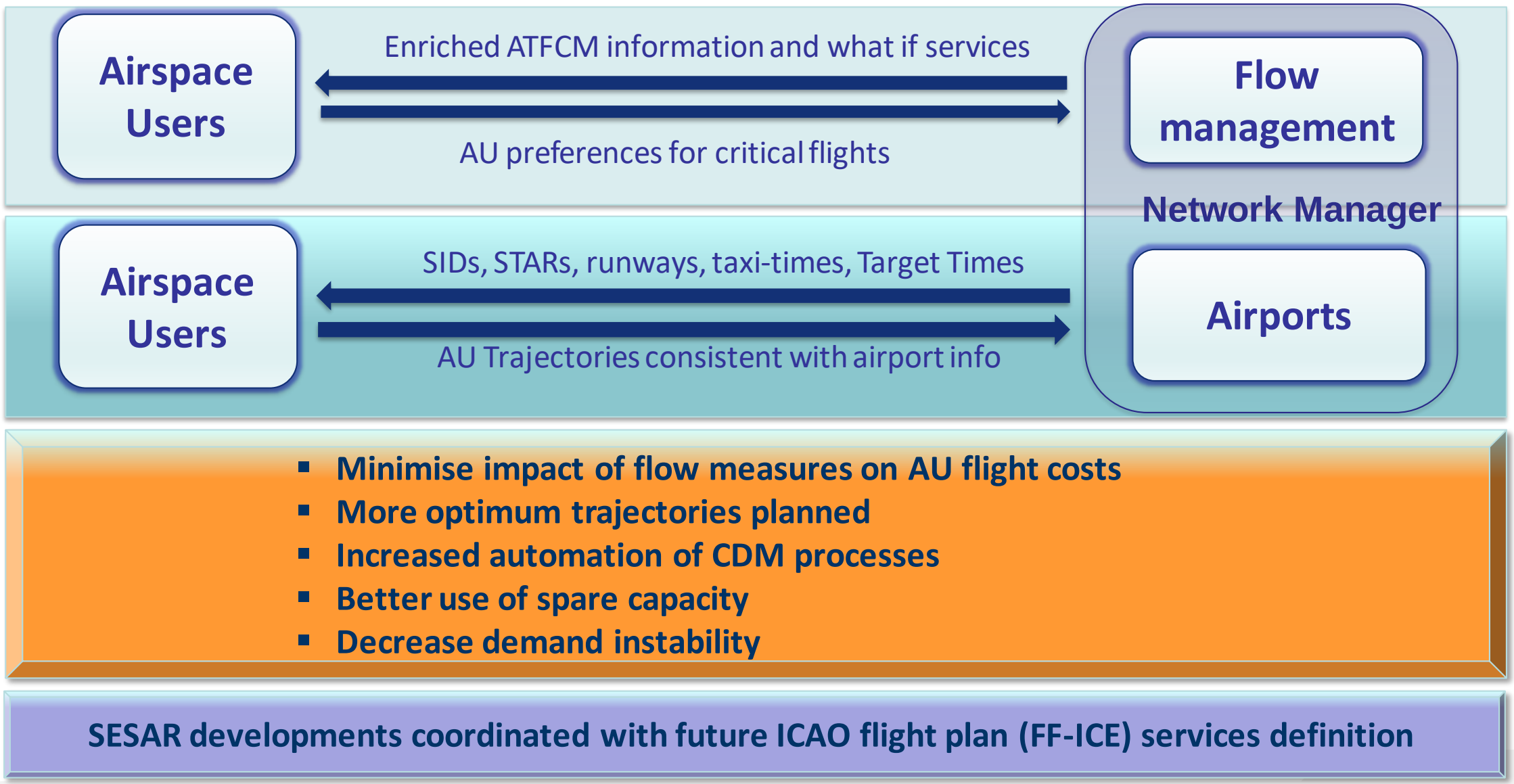
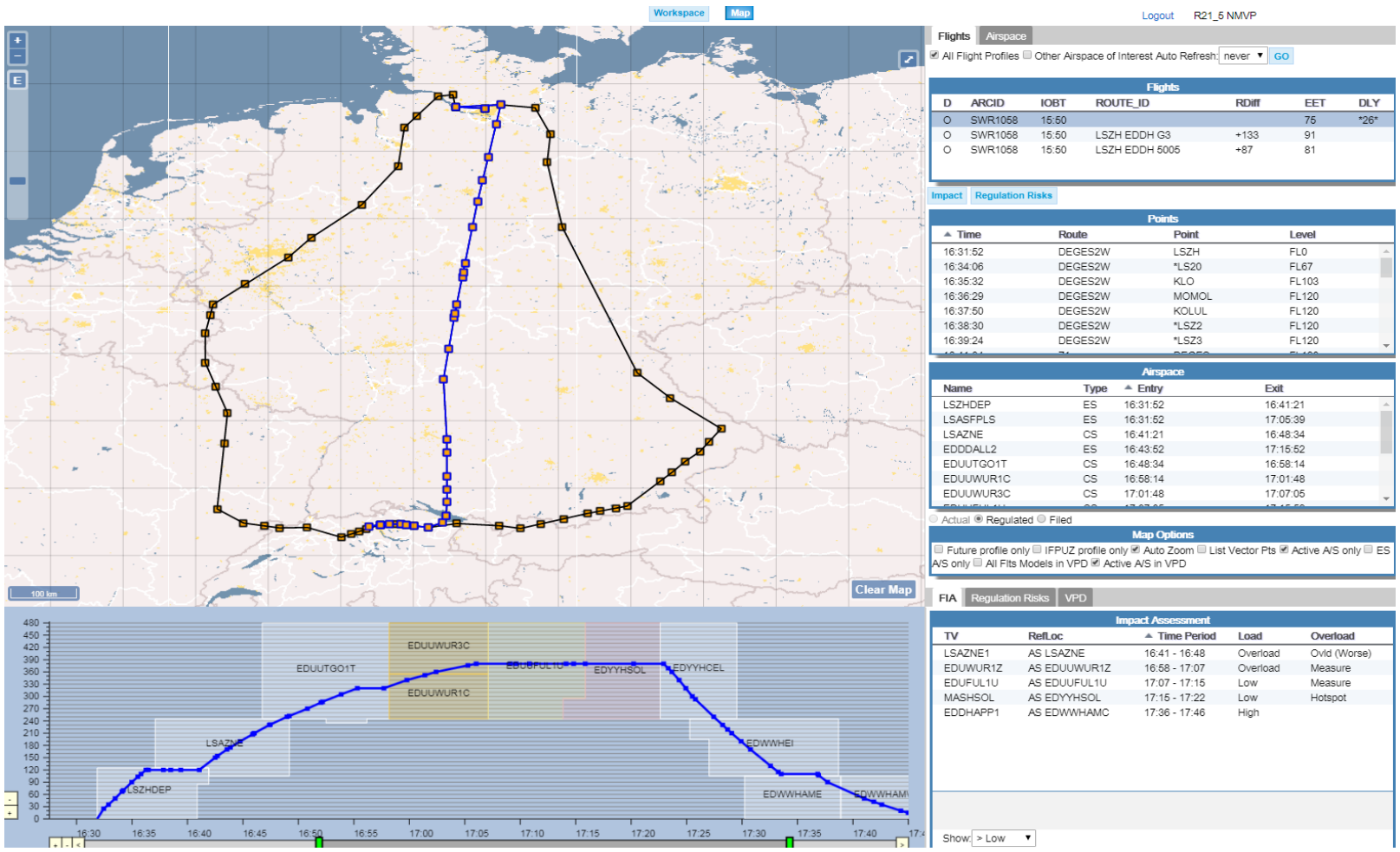


- Minimise impact of flow measures on AU flight costs
- More optimum trajectories planned
- Increased automation of CDM processes
- Better use of spare capacity
- Decrease demand instability

SESAR developments coordinated with future ICAO flight plan (FF-ICE) services definition

Enriched DCB information and what-if function



ATFCM regulations, hotspots and
congestion indicators along planned and what-if trajectories

Results and conclusions

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4 SESAR exercises involving more than 15 dispatchers, 3 ANSPs, NM and one CFSP.

Enriched ATFCM information and advanced what-if services

- Support **both AU driven and FMP/NM driven** decision processes related to trajectory revisions
- **Up to 25% of ATFCM en-route delay reduction in winter season** due to better use of spare network capacity
  Limited negative impact on fuel efficiency
- **Around 15% of inefficient AU flight plan changes can be avoided** thanks to better awareness of ATFCM situation
- CBA Net Present Value: **119 M€**

AU preferences – Flight Delay Criticality Indicator

- Procedure accepted by all actors and partially implementable at short term
- Scenarios played with AUs allowed to declare up to 1% of their fleet as critical flights
- CBA Net Present Value: **71 M€**

Airport information in AU flight planning

- Strong support from AUs and the CFSP to integrate departure information (planned runway, SID, taxi time) from CDM airports in flight planning
- Use-cases clarified and agreed

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USER DRIVEN PRIORITISATION PROCESS

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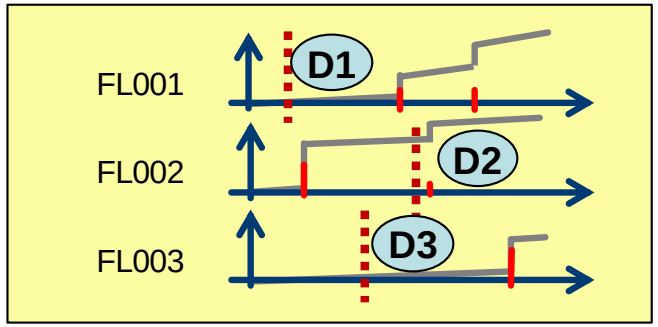
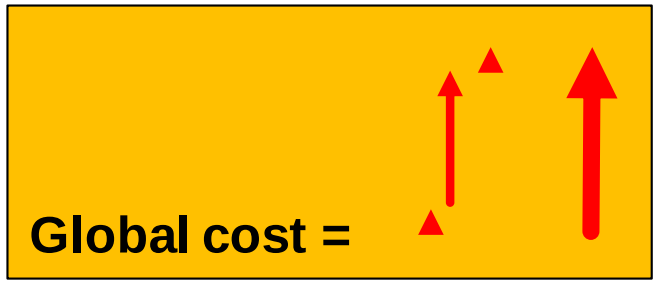
User Driven Prioritisation Process - UDPP

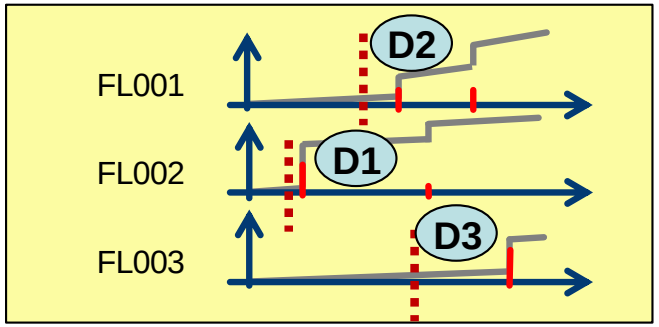
Brings to Airspace Users the flexibility they need to reduce their cost of delay, in coordination with ATM stakeholders

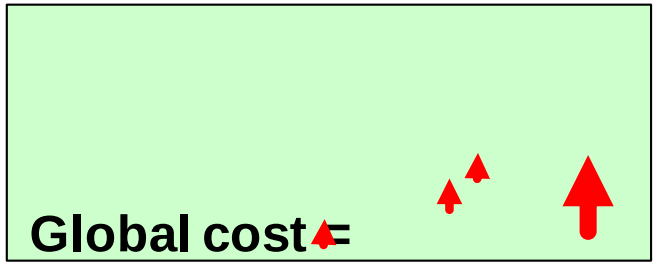




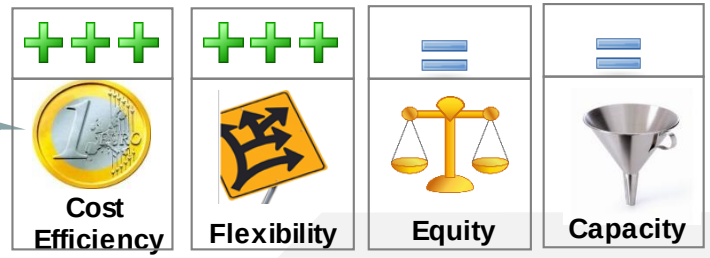
Delay redistribution
(Slots reordering)

FL002 <- FL001
FL001 <- FL003
FL003 <- FL002





EQUITY
No impact on other AU flights



Validation results - Maturity reached

- 3 simulations with Airlines (Swiss, AF, HOP, Air Baltic, ELAL, IATA) and Airports (Schiphol, Heathrow, Munich) in 2019
- Average 40% reduction of cost of delay and improvement of passenger connections at ECAC level → positive CBA: Net Present Value **192 M€**
- Rapid transition to shadow mode trial by Swiss and Skyguide
- The AU methods of prioritization now stabilized and mature
- Wave 2 will address further integration with NM (e.g. network impact) and airport processes (e.g. impact on airport resources)

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Dynamic Airspace Configuration & Demand Capacity Balancing

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Dynamic Airspace Configurations

Objectives:

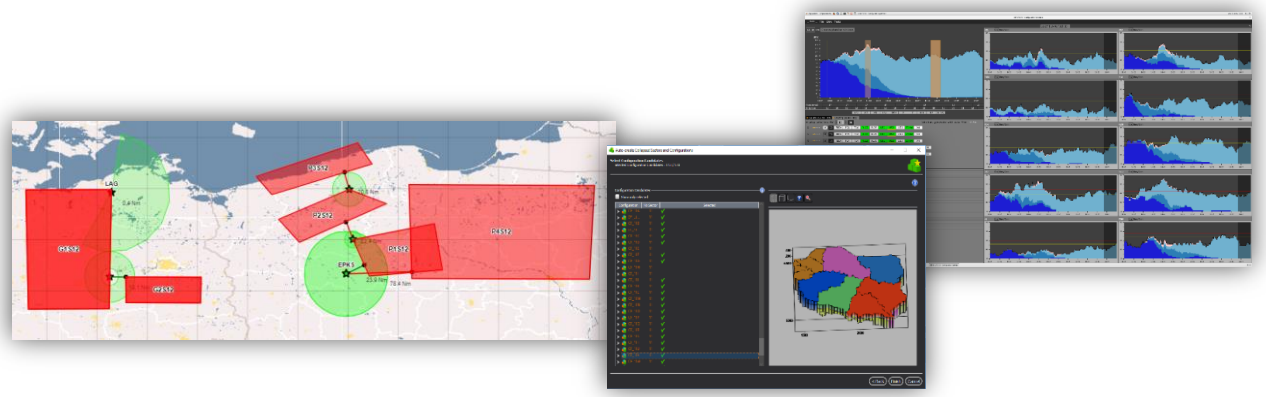
- Increase flexibility in Airspace Management to better exploit capacity/efficiency opportunities
- Respond to performance objectives of increasing traffic & new entrants

Solutions to be deployed after SESAR 2020 Wave 2:

- Dynamic sector design/configuration with sharable modules to accommodate optimized free route traffic patterns
- Dynamic airspace reservations (position and volume)
- CDM process at Regional, FAB and local levels for a cost-effective resource management
- Automated design and management

Expected benefits:

- Increased en-route network capacity
- Reduced flight duration variability
- Increased fuel efficiency
- Cost efficiency



Demand Capacity Balancing (DCB)

PJ09 DCB
PJ24 NCM
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Objectives:

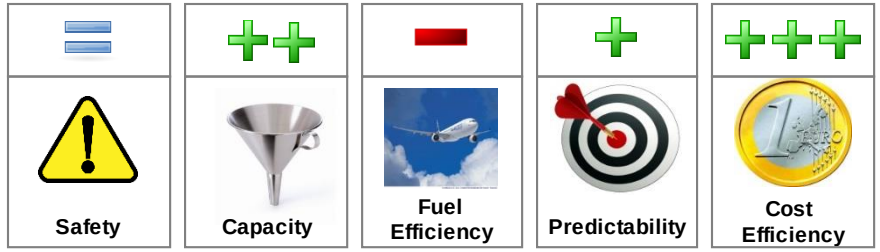
- Improve demand/workload predictability at Network level to release capacity buffer
- Integrate local DCB processes with central processes to optimize the Network Operations Plan
- Replace regulations by targeted measures minimizing the impact on demand and taking into account AU business preferences

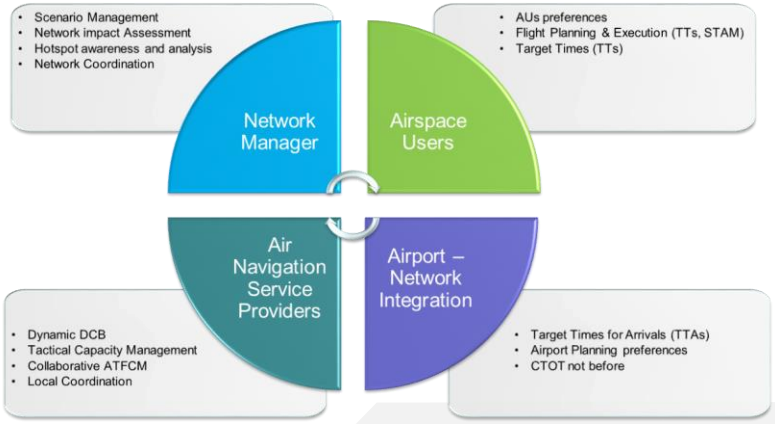
Solutions to be deployed in short timeframe:

- Targeted flow/flight measures e.g. level-capping, re-routings, flow/flight ground delays, slot improvements and exclusions
- Target Time of Arrival (TTA) measures to reduce arrival delay and optimize arrival sequences
- Early exchange of departure planning information for predictability improvements
- Enhanced ATFCM slot allocation (CASA) with interacting regulations optimization

Demand Capacity Balancing – Performance benefits

- Tactical fine-tuned delay measures (MUAC): ~150.000 min of delay saved for 5000 flights during the Summer 2018
- Tactical level capping (DSNA): Collaborative Advanced Planning (CAP) avoided 12 potential regulations ~4111min of delay on a single traffic flow (15 day-trial in Summer 2017)
- Target Time of Arrival (NATS and HAL): reduction in AFTM delay between 26-41% (1081 flights) compared with conventional regulations (12-day trial in Spring 2019)
- Limited negative impact on fuel efficiency
- DCB solutions in the top 3 of benefit contributors in SESAR Wave 1 performance assessment
- Enhanced CASA promising: ~10% network delay reduction





Conclusions and follow-up activities

- **Very tangible and significant benefits for airlines in particular in terms of ATFCM delays cost saving**

- **Some of the SESAR solutions are already in deployment or will be deployed at very short term**
  - Targeted re-route proposal measures shared with the network in cooperation with AUs (N-CAP)
  - Targeted flow/flight measures (slot improvements/exclusion) including AU's priorities
  - Optimised Airport Planning integrated with Network using Arrival Target Times measures

- **SESAR Wave 2 will deliver other solutions for deployment from 2023. Main focus will be on:**
  - Integration of ATFCM information in AU systems.
  - Automation of CDM processes

Thank you for your attention!

Go and see demos for more detailed information