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Air Traffic Flow & Capacity Management

Frederic Cuq

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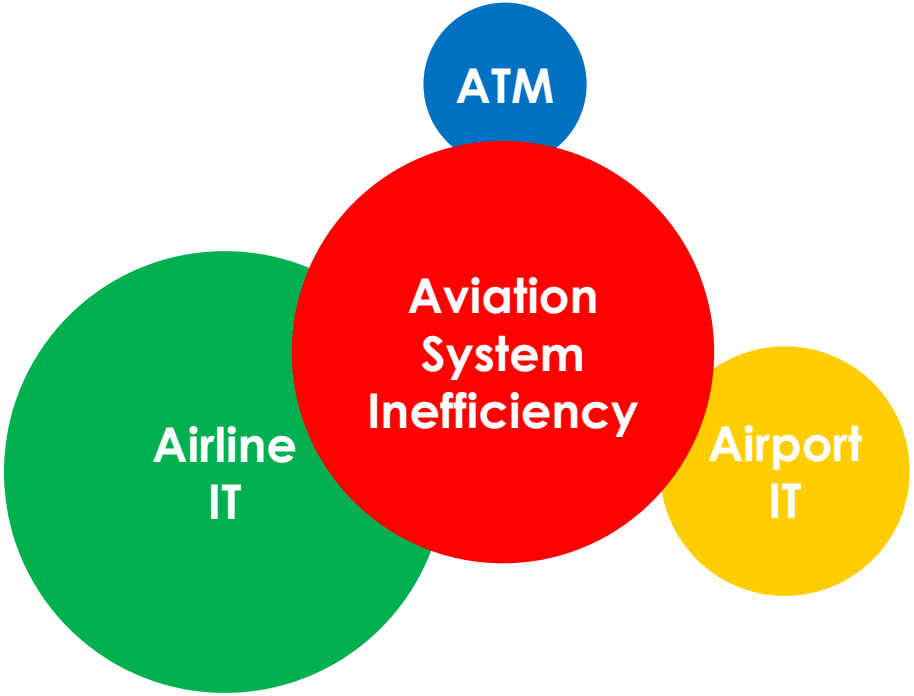
Why Do We Need ATFM/CDM?

Why do we need flow management?



- Large investments in IT infrastructure by all stakeholders
- Good optimisation of each stakeholder's own operations
- Very little optimisation across the stakeholder boundaries
- Still > $9B in aviation system inefficiency per annum

Small gains in aviation operations efficiency = large value / benefits

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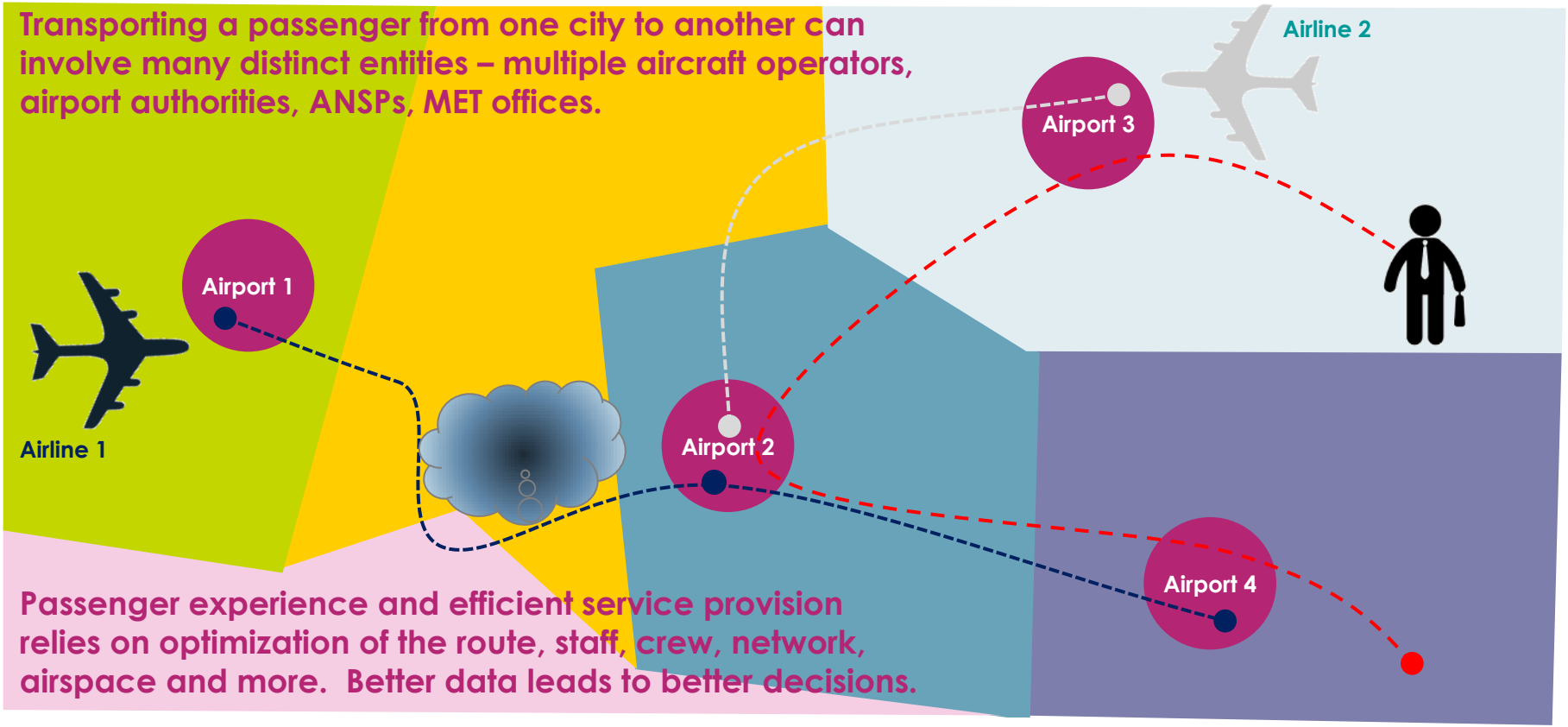
Access to and integration of disparate data is the key to anticipating and optimizing aviation operations and passenger needs



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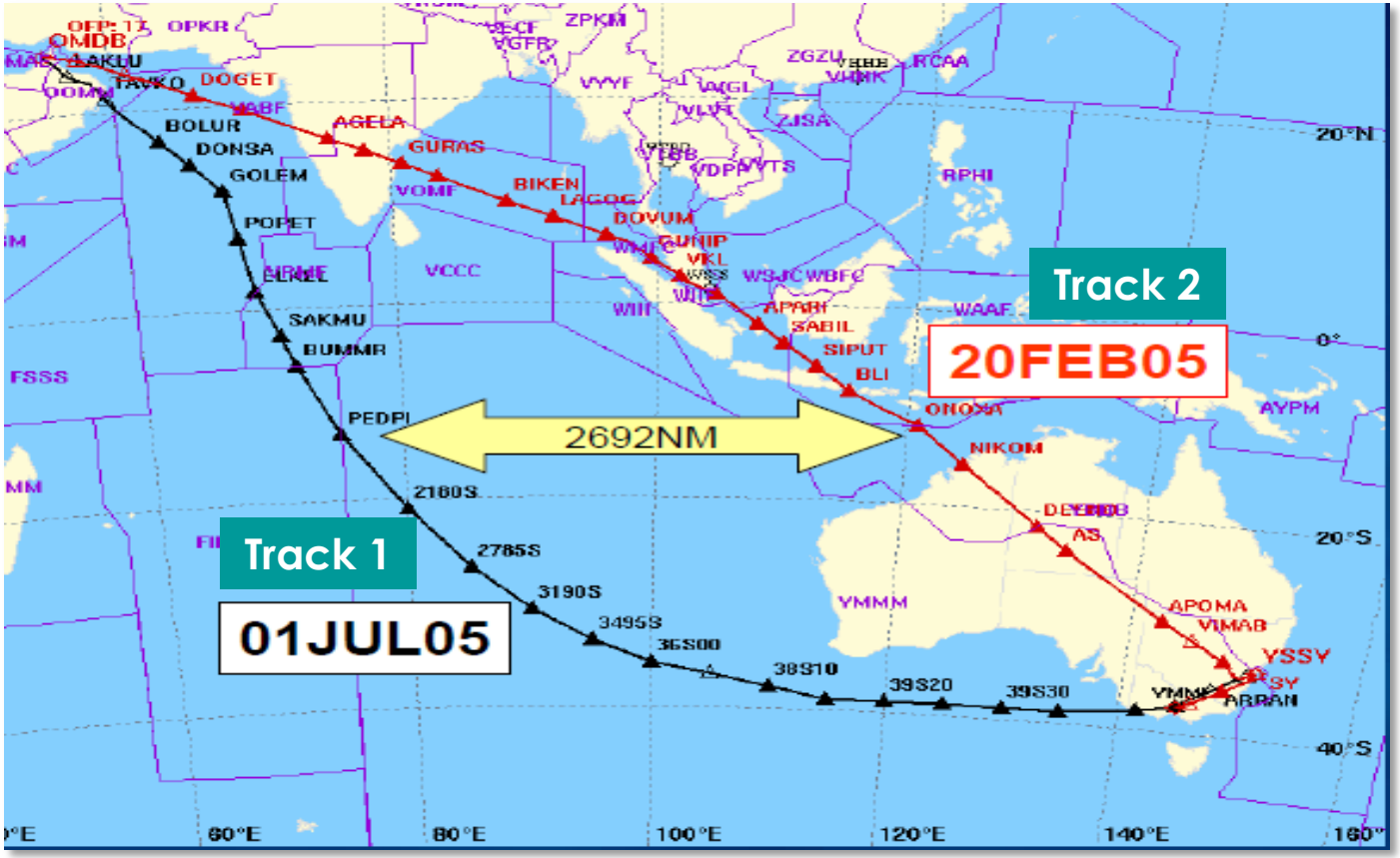
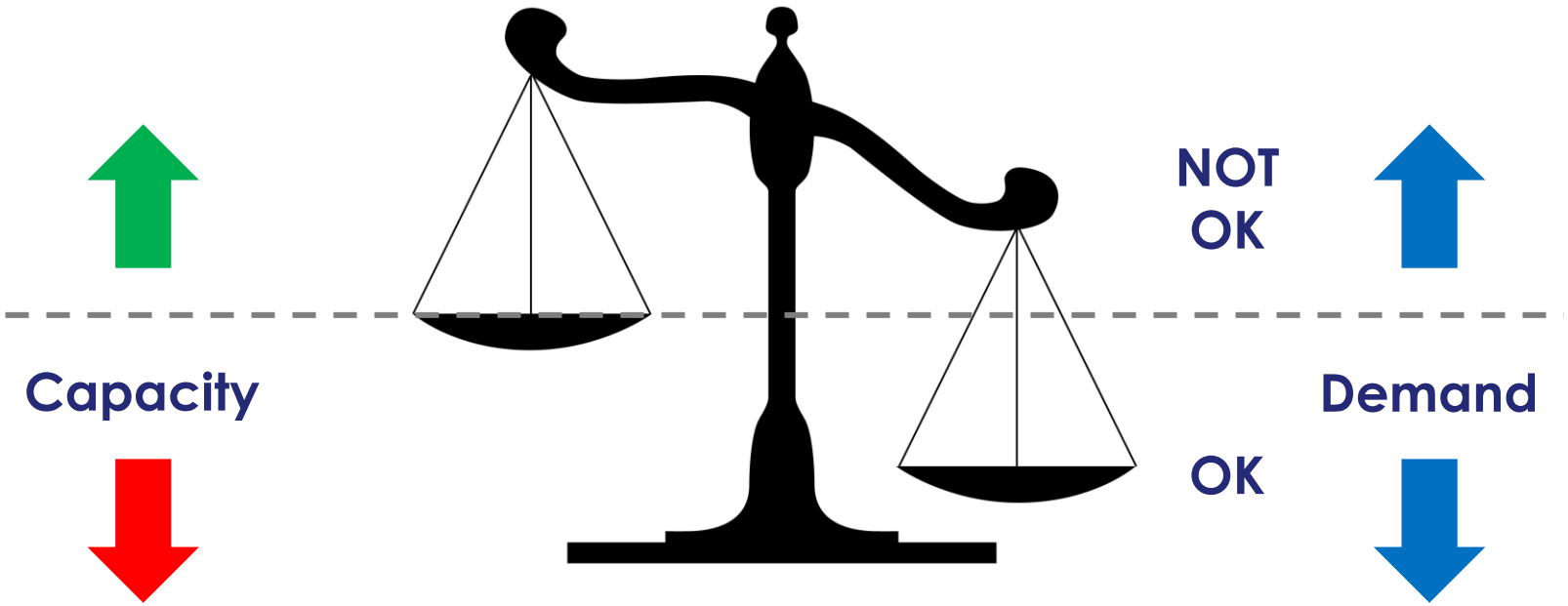
Airspace demand can vary significantly



What is Traffic Flow Management



Traffic Flow Management are the tools and processes to adjust aviation operations to demand / capacity imbalance

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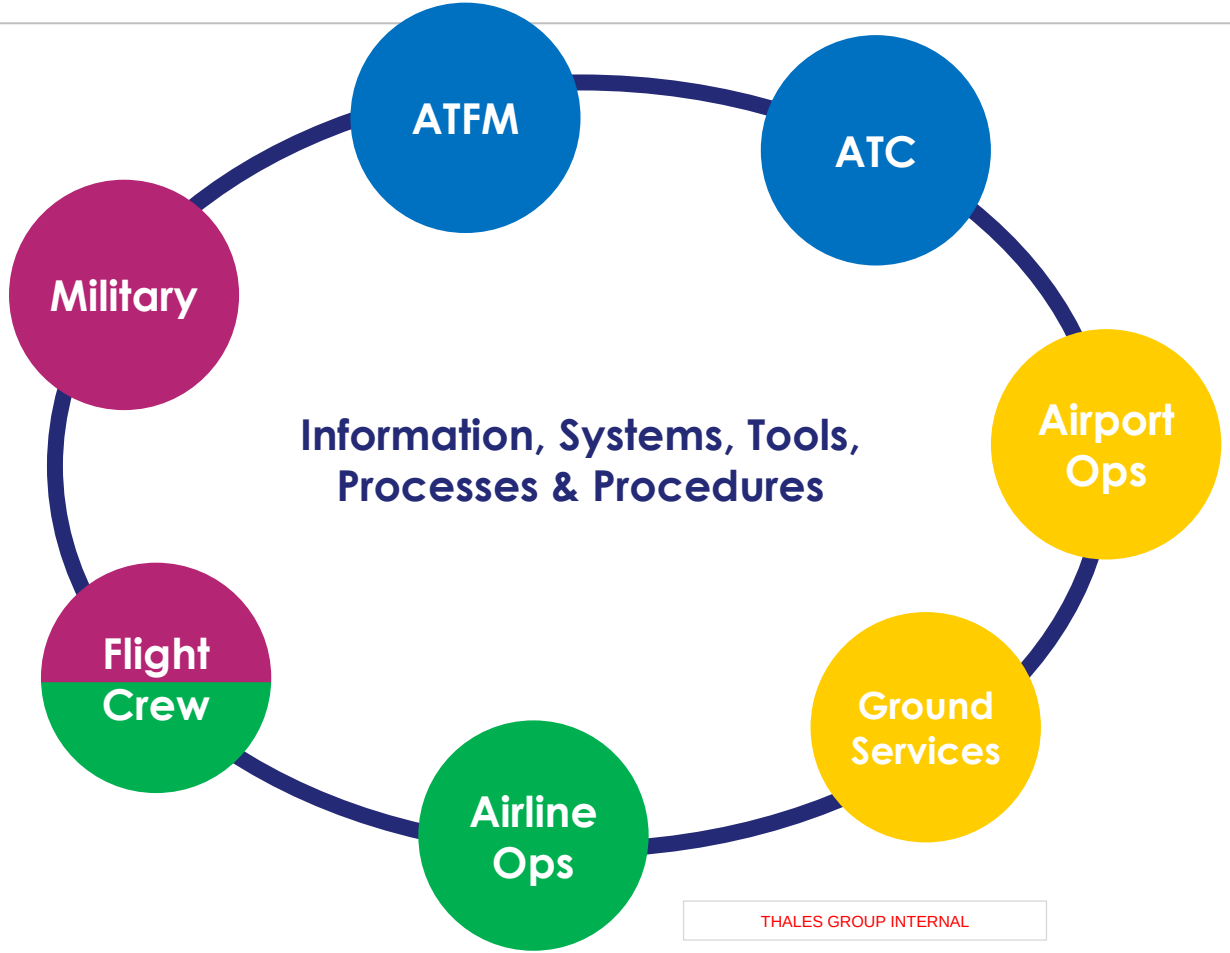
What is Collaborative Decision Making



CDM is an approach whereby a group of stakeholders work together to solve common problems using agreed tools, processes and procedures

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Most significant airspace capacity factors

ATM system availability (Controller's equipment)

Human factors (ATC workload)

CNS system availability

Air space design

Weather

Separation standards

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Most significant airport capacity factors

ATM system availability (Controller's equipment)

Weather

Runways & Rapid Exit Taxiways

Separation

Aerodrome design

Slots

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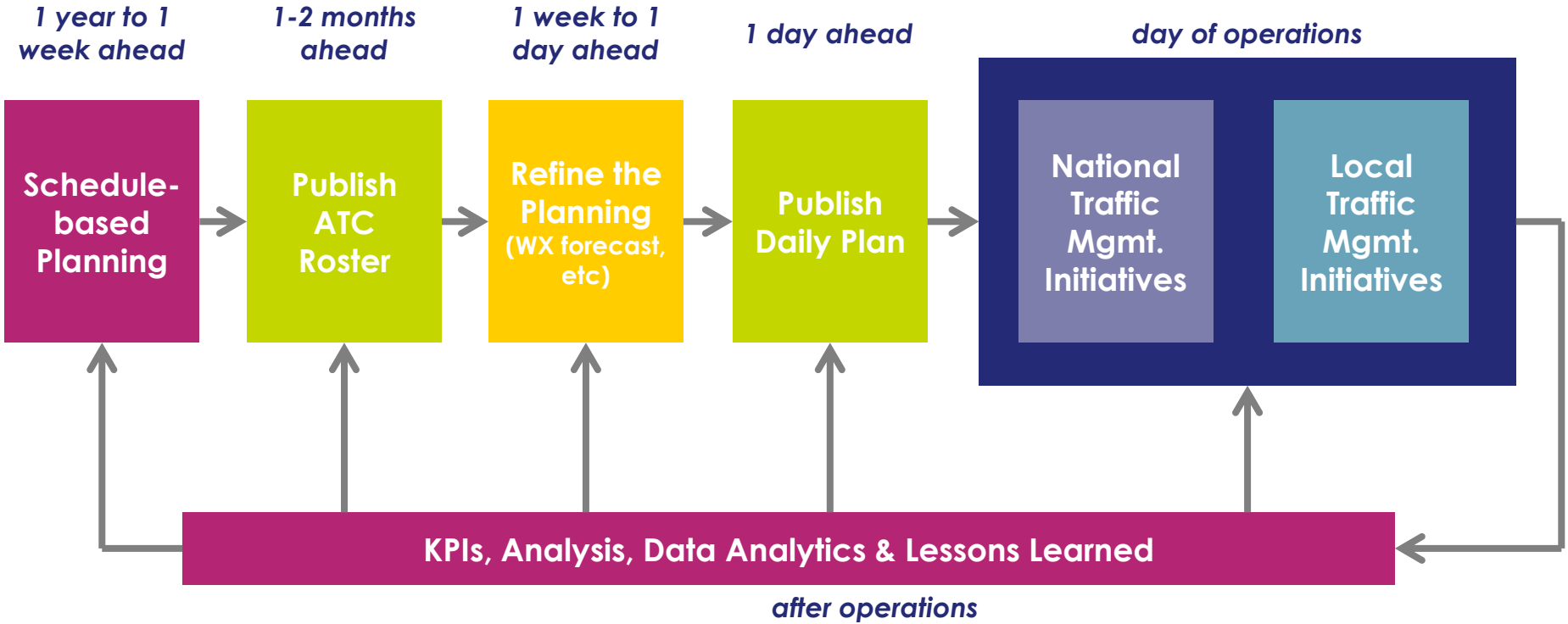
ATFM/CDM
Key Concepts

Demand/Capacity Balancing Continuum (ATC perspective)



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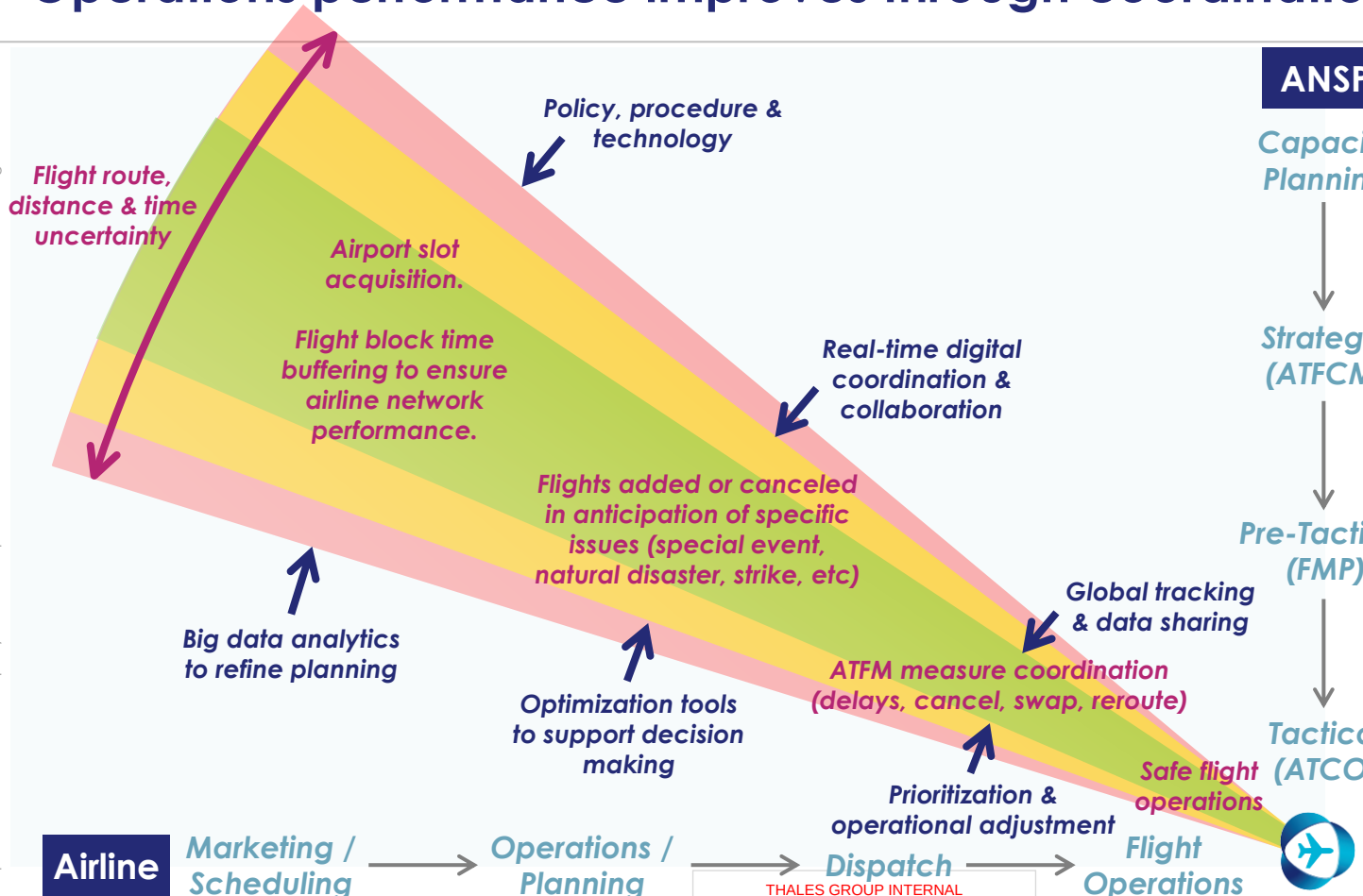
Operations performance improves through coordination



Airlines, ATC & Airports are following analogous processes to plan, refine and operate their services.

Performance improves thru collaboration & data sharing.

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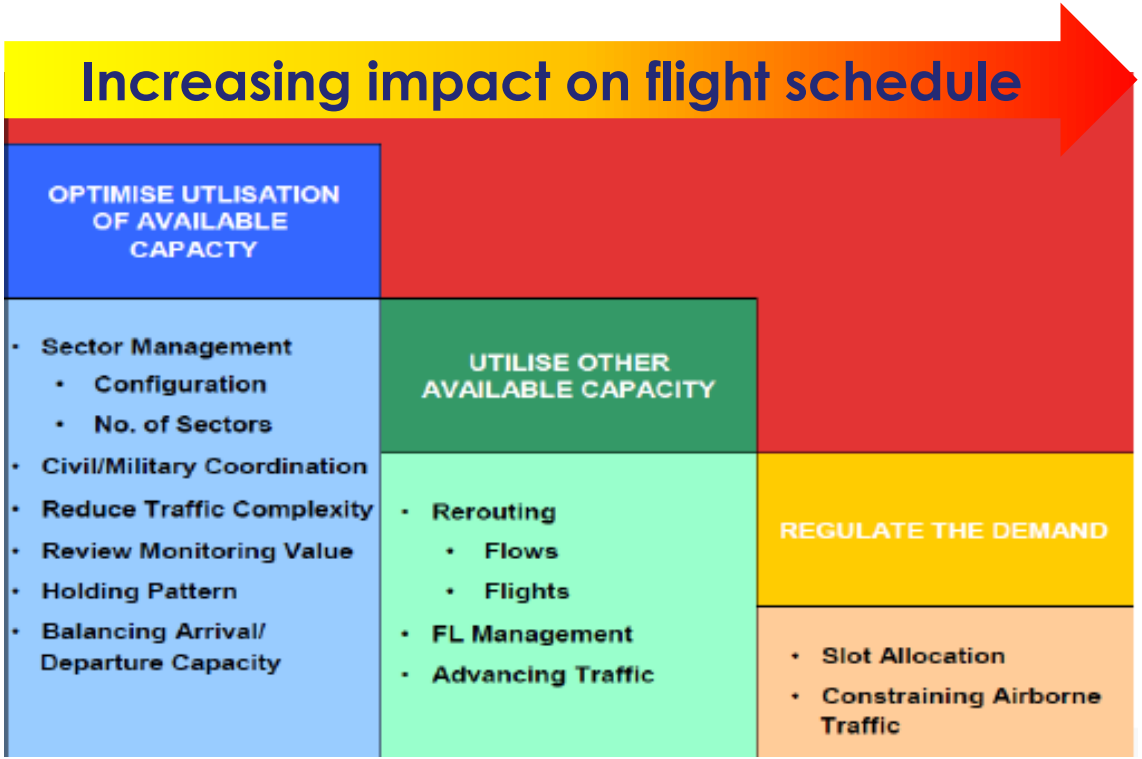
ATFM is much more than Slot Management



EUROCONTROL

Need automation to apply the right action to the right flight at the right time

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Thales Solution for ATFM/CDM

Thales ATFM Philosophy – blending best practices from around the world

- Don't regulate traffic unless a problem is anticipated
- Use the correct tool (measure) for the problem faced
- Target equitable sharing of any operational impacts
- Provide airspace users the ability to share & select preferences
- Do not over-constrain flights
- Create incentives to encourage participation and compliance
- Combine policy and procedures with technology
- Use the analytics to improve forecasts and decisions

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Prioritized approach for managing demand/capacity imbalance

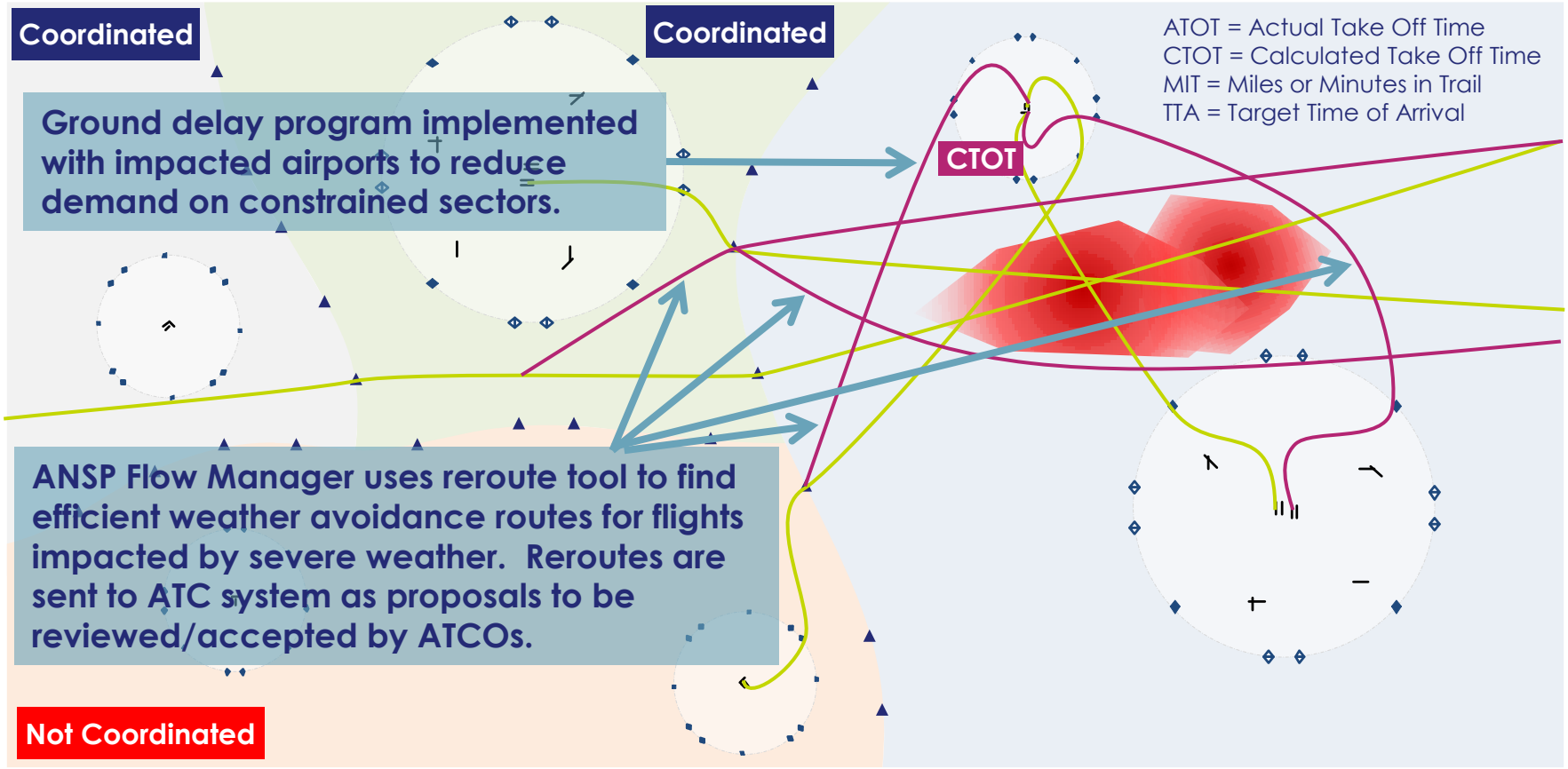
Address airport issues where demand approaches or exceeds capacity

- Ration by schedule allocation of flights to available airport capacity (metering)
- Load balance runways to accommodate demand
- Calculate take-off times and metering point times (upstream metering)
- Utilize sequencing (AMAN) to maximize utilization of available capacity
- Balance departure flows (DMAN) with arrival flows to ensure smooth operations

Address airspace issues once airport flows are planned

- Identify hot spots (capacity / complexity overload) which require management
- Evaluate available measures (route, speed, level, rate, time, sectorization, etc)
- Implement changes to flights or flows (including coordination with stakeholders)
- Monitor impact and continue to adjust as needed

Example: En route flow constraint management



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a data-driven solution, providing

decision support for improved aviation operations

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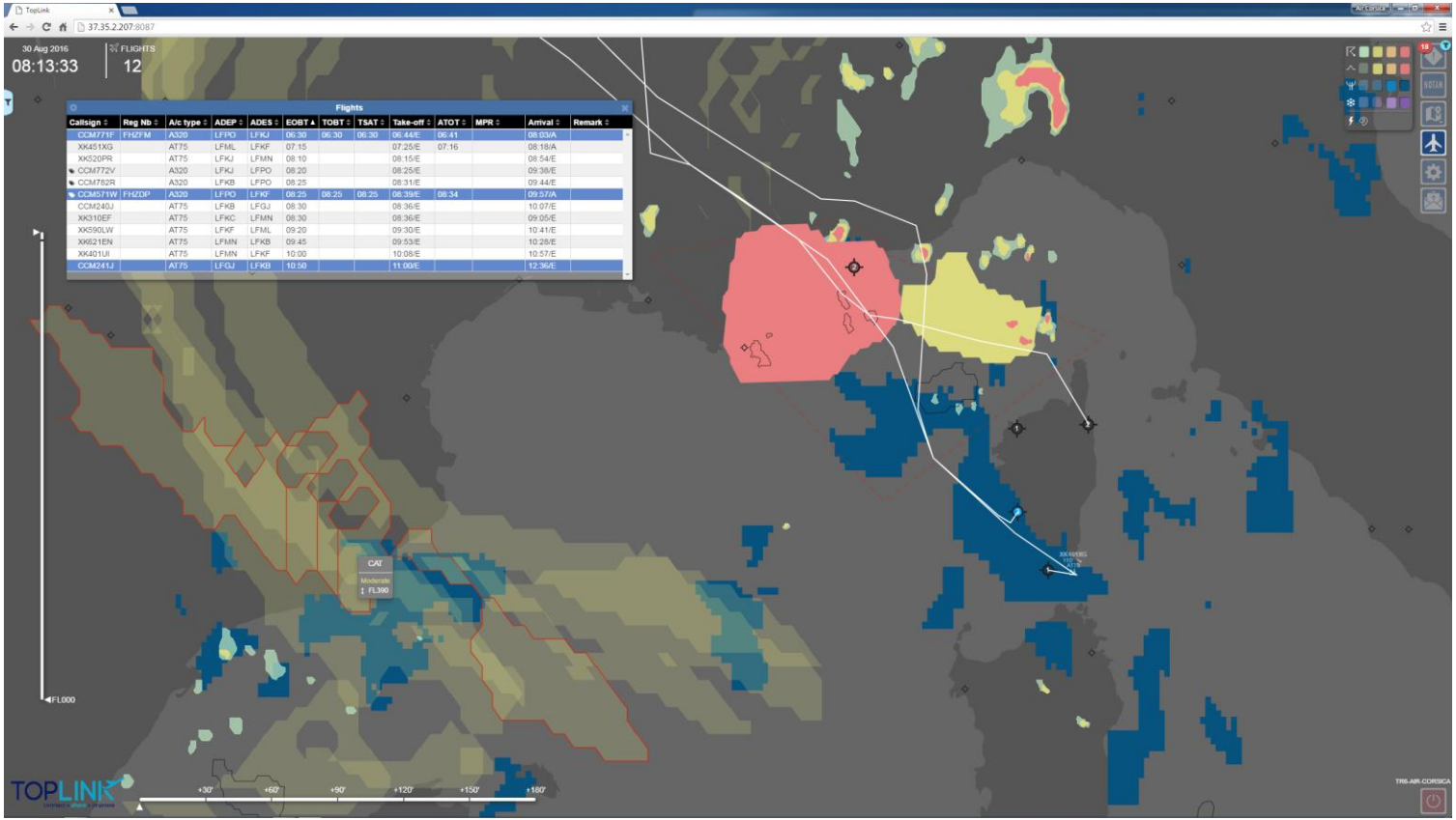
ECOsystem HMI



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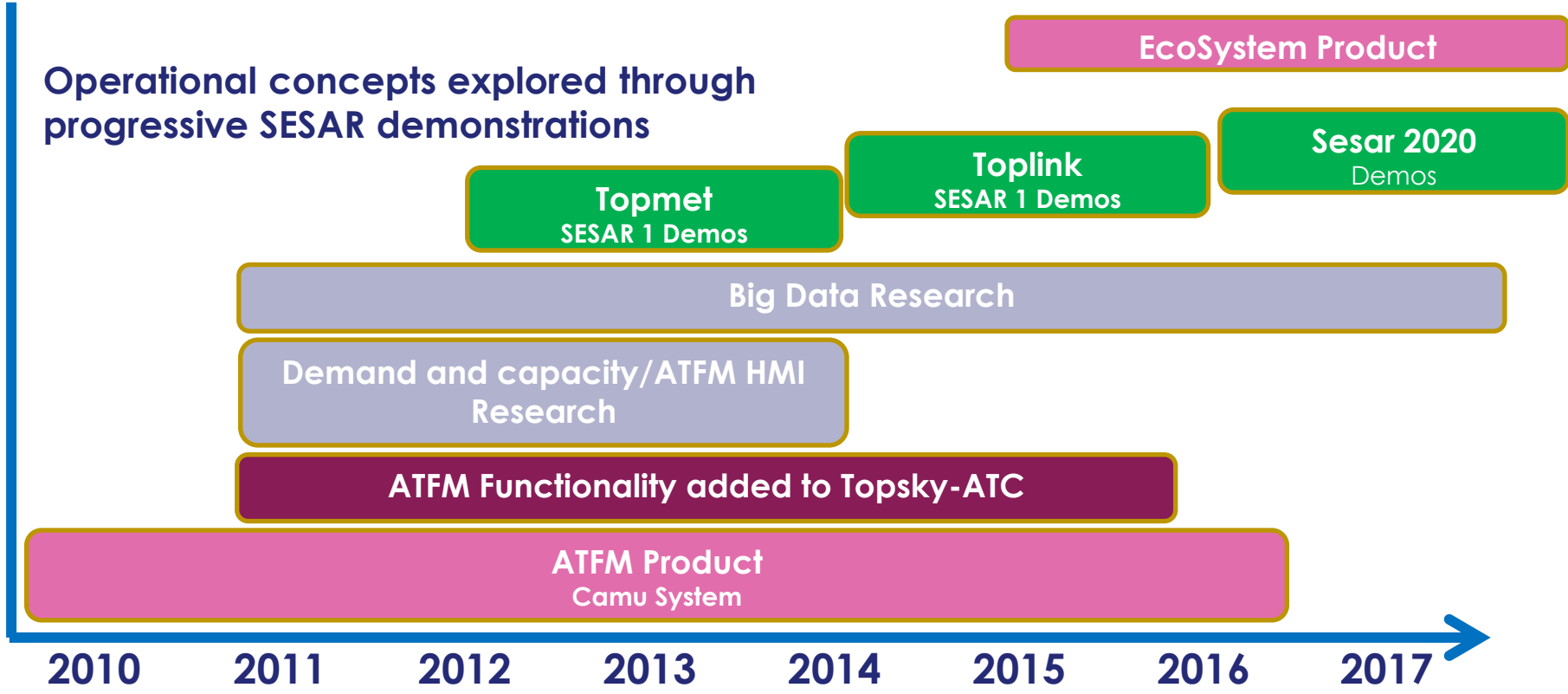
ECOsystem Historical Timeline



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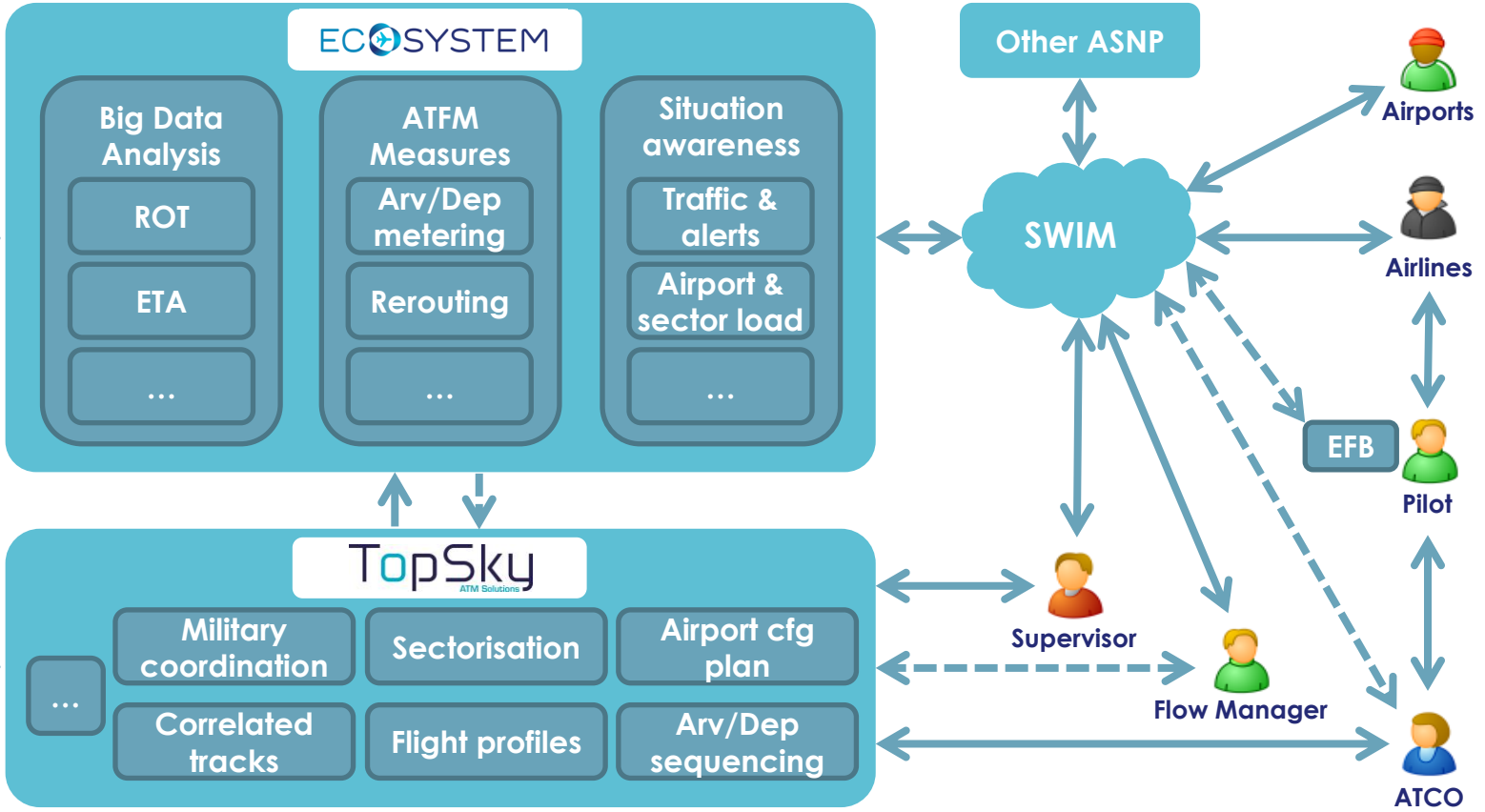
TopSky-ATC and ECOsystem work together to improve decisions

Global data sources:
- Surveillance
- Flight Plans
- Aero data
- WX/Meteo
- Flight Schedules
- Remote ATFM measures
- Remote airport status

Local data sources:
- Surveillance
- Flight Plans
- Aero data
- WX/Meteo
- System status



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ECOsystem – Solutions for Efficiency & Capacity Optimization

Efficiency & capacity-oriented solution

- Companion to safety-oriented TopSky-ATC

Modern Big data and web-technology based platform and architecture

- Flexible, modular, scalable and cost-effective
- Able to host specific local/regional algorithms and applications

Targeting major sources of aviation system inefficiency

- ANSP cost and controller productivity
- ANSP flow management – airspace and airport optimization
- Airline flight operations cost
- Airline schedule reliability
- Airport operations

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