



Integrated Arrival and Departure Runway Sequence

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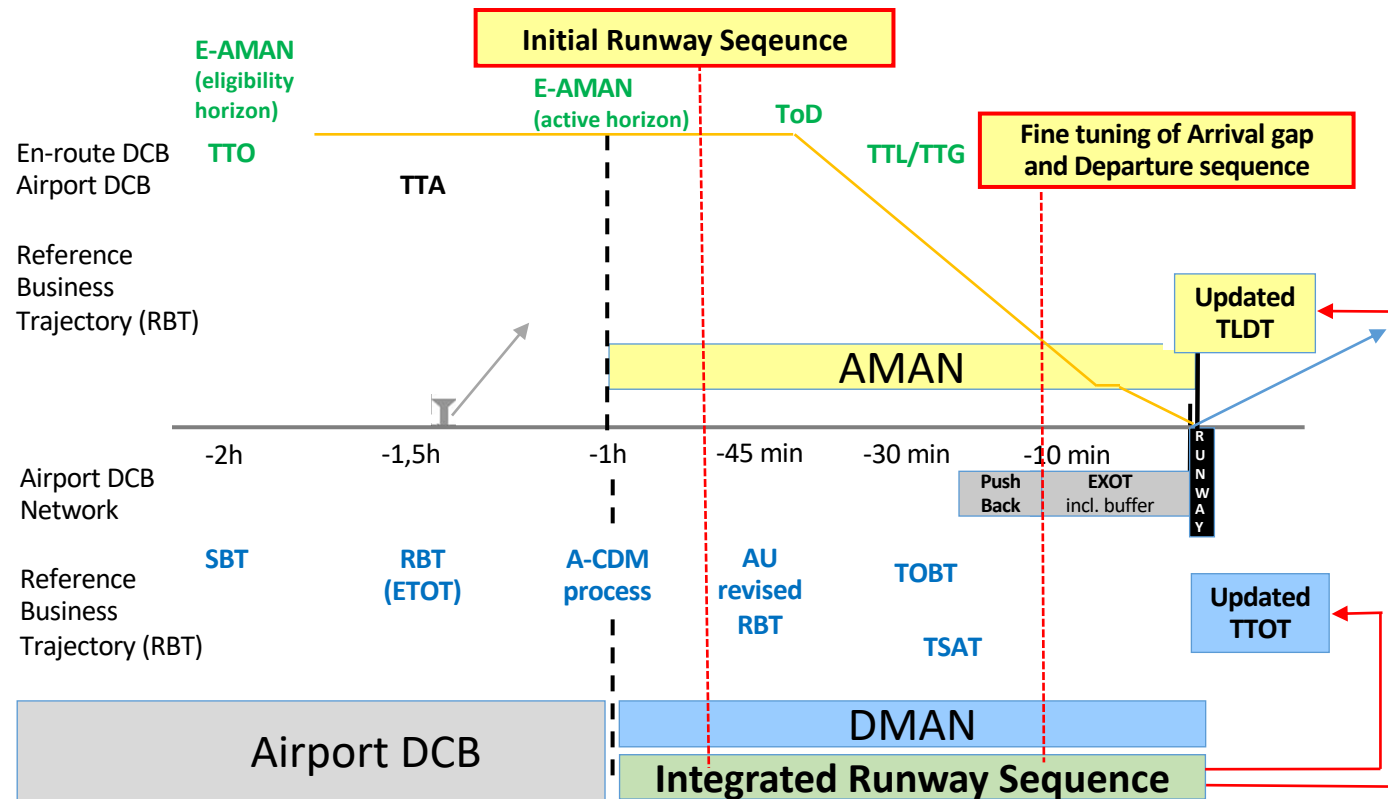
Integrated Arrival & Departure Runway Sequence

- Balancing of Arrival and Departure flights
- Balancing of flights between runways
 - **Save Environment and reduce cost**
 - Increase Airport Capacity
 - Maintain High Safety levels
 - Increase Predictability
 - Improve Planning
- Integrated Runway Sequence Function is validated with good results and now ready for deployment

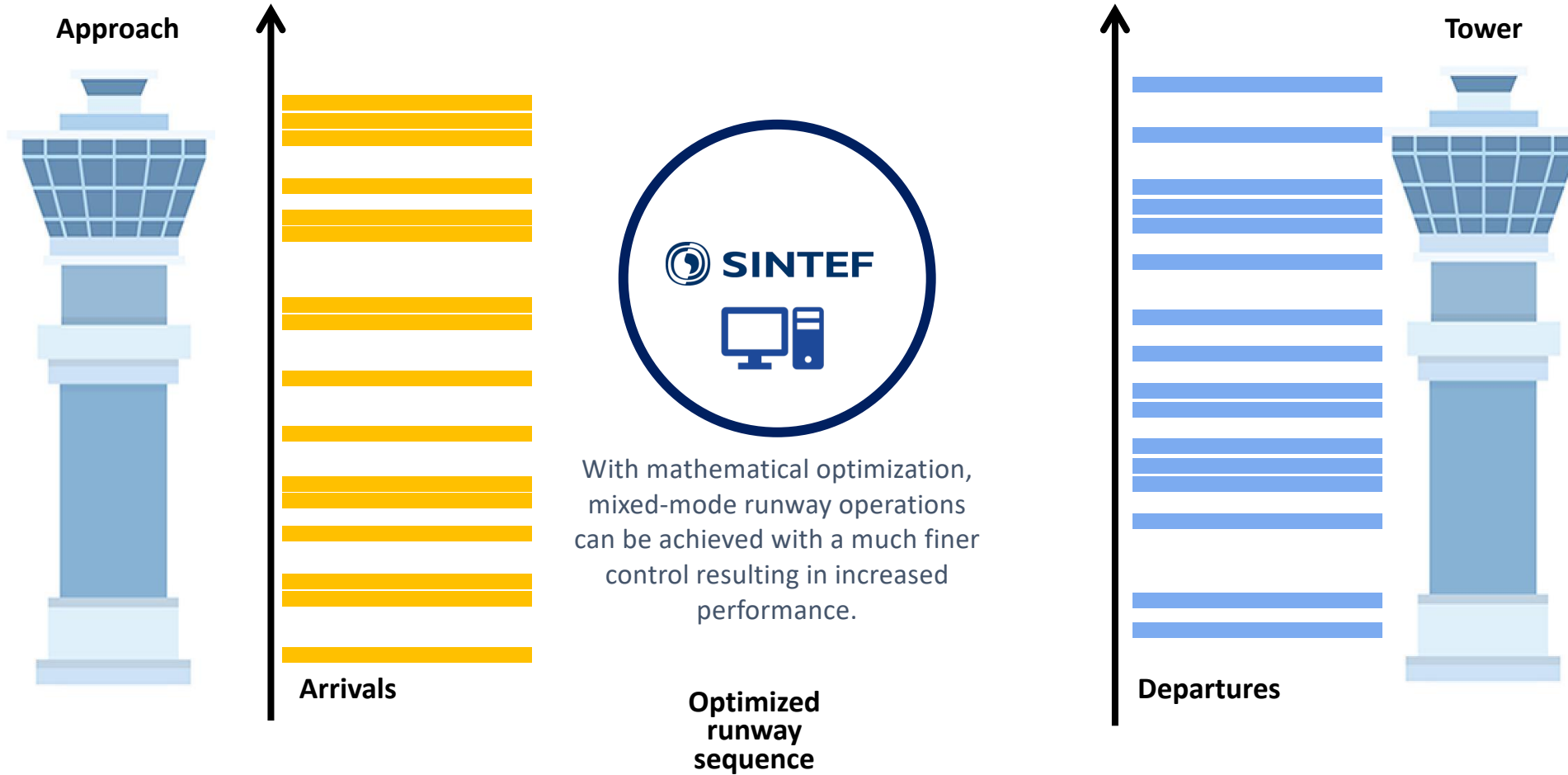
New advanced operations



Concept of Integrated Runway Sequence



Optimization of the runway sequence

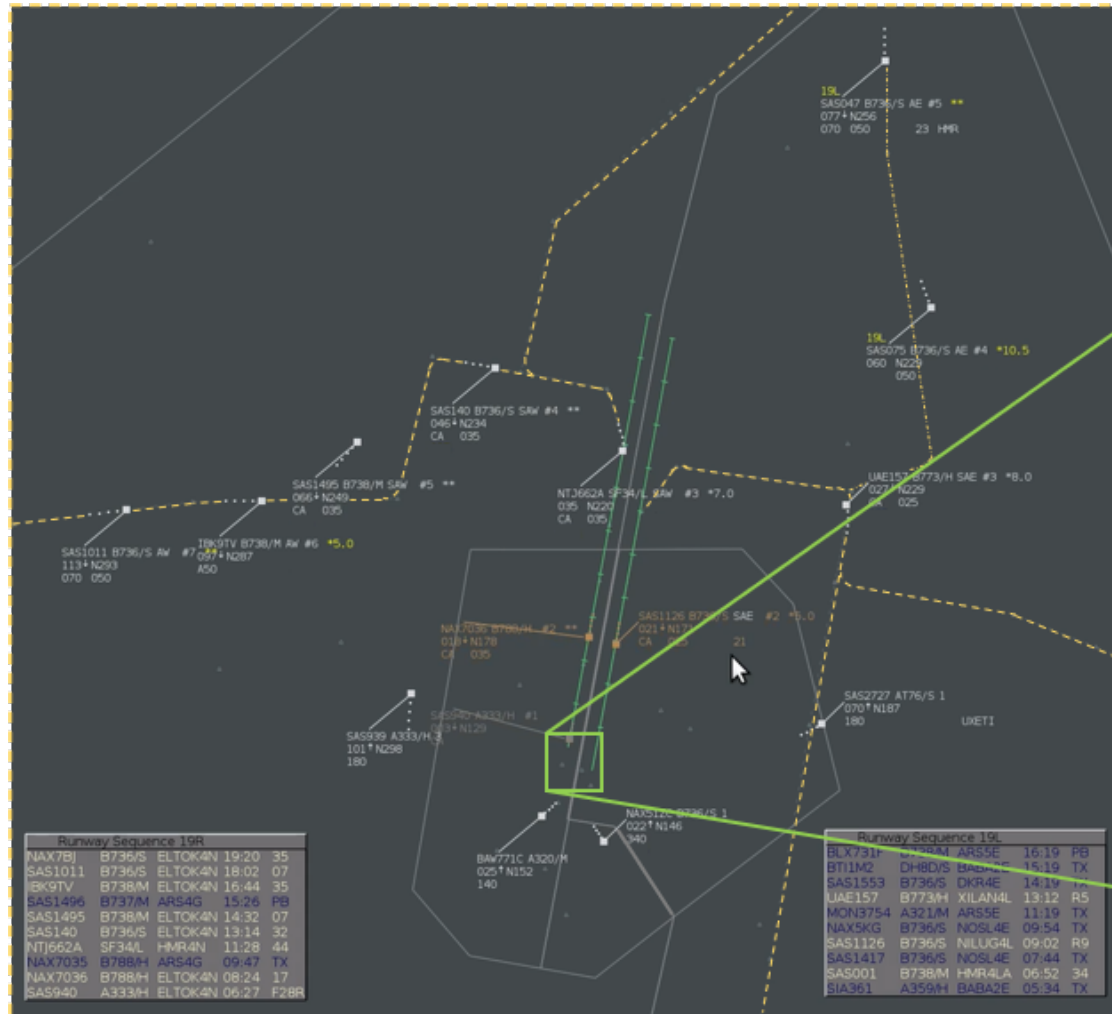


Concept validated at European airports

- Real Time Simulation in Stockholm-Arlanda environment
- 2 min. video
 - <https://www.youtube.com/watch?v=uryuweDiWv4&t=6s>



Parallel Runways in mixed mode operations



Integrated Runway Sequences with balancing of arrivals and departures on parallel runways, including balancing of arrivals to runway 19 L



Radar label with sequence number

Next step - Live Trials

- **Live Trials of Integrated Runway Sequence Function in Stockholm**
 - **Trials with shadow mode operations at Arlanda TWR and Stockholm APP**
 - **Close coordination with ATC, Airport Operator and Airspace users**
 - **Provide detailed calculation of benefits, capacity and environmental improvements**
 - **Bring the concept to deployment.**

SESAR 2020 VDL3

- **LFV-COOPANS, SINTEF and SWEDAVIA**



SESAR PJ02

SESAR Solution data pack is publicly available

Link to the CORDIS place;

<https://cordis.europa.eu/project/id/731781/results>

Find all PJ02 solutions

- go to solution PJ02-08
- see PJ02-08-01
 - Integrated Runway Sequence Function

SUPPORTED BY
SESAR
JOINT UNDERTAKING

PJ02
EARTH

COOPANS
REAL COOPERATION, REAL RESULTS

LFV
Lufthansa Flight Services
OF SWEDEN

Integrated Runway Sequence Function

Traffic Optimisation on Single and Multiple Runways

- Optimised Sequence of Arrivals and Departures
- Balancing of flights between runways
- Reduced environmental impact
- Optimised airport capacity

BENEFITS

STAKEHOLDER

- Improved predictability for ATC
- Optimised airport capacity
- Reduced cost for Airspace Users

ENVIRONMENT

- Lower carbon dioxide emissions
- Lower fuel consumption
- Reduced queueing



Optimized throughput with Integrated Runway Sequence

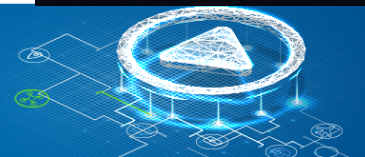
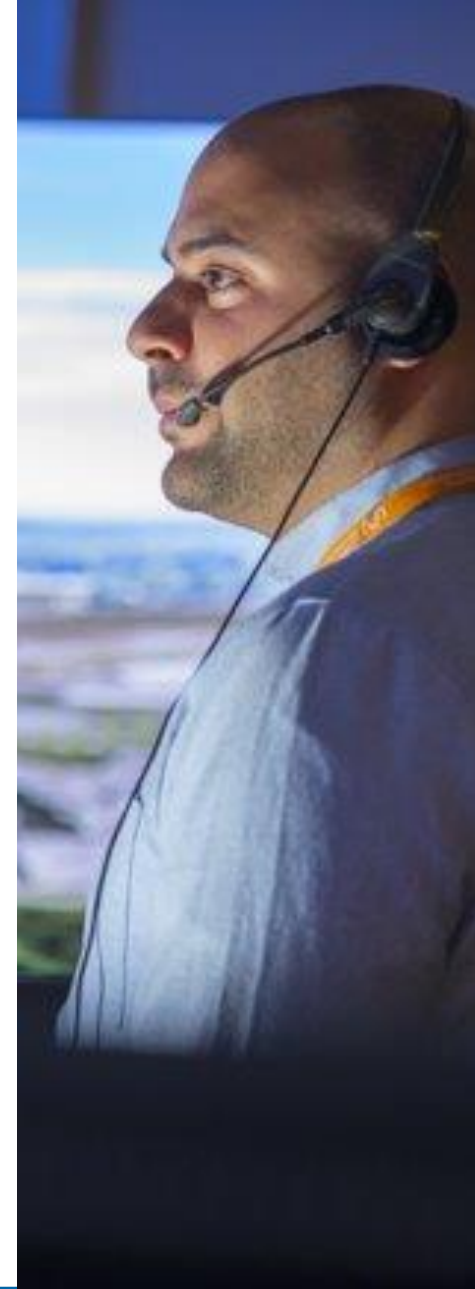


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Optimised Runway and Airport Capacity

PARTNERS



This project has received funding from the SESAR Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement 731781



Real time simulation in Stockholm-Arlanda environment performed by LFV (COOPANS).



Watch a film about the project.



Utgåva 1.0.2019.11.28



Integrated Runway Sequence Function

Traffic Optimisation on Single and Multiple Runway Airports

Optimised integration of Arrival and Departure flights on single and multiple runways resulting in a more efficient planning and environmentally friendly airport with optimised capacity.

Reduced queuing time at runway hold and in the air, provide savings with lower fuel consumption and leads to lower carbon dioxide emissions.

For multiple runways the Integrated Runway Sequence Function provide options for balancing of Arrival/Departure flights between the runways before Arrival flights top of decent. This will ensure maximised throughput of Arrival and Departure flights at the airport.

Enhanced early planning and optimised management of Arrival/Departure flights provide reduced cost for Airspace Users, optimised capacity for Airport Operator and improved predictability.

Integrated Runway Sequence

- Optimising Arrival and Departure Sequence
 - Balancing of flights between runways
 - Reduced environmental impact
 - Optimised Capacity

Traffic Optimisation on Single and Multiple Runway Airports

STAKEHOLDER BENEFITS

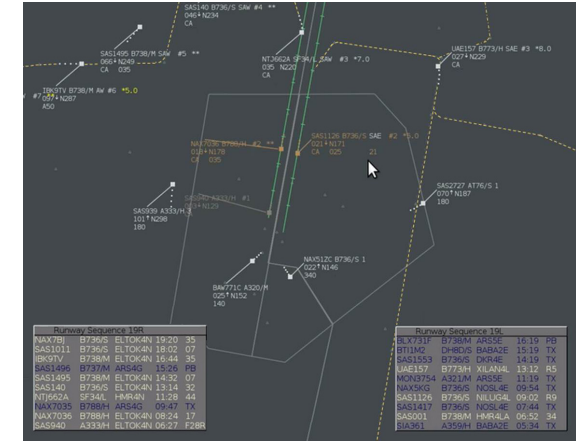
- Improved predictability for ATC
- Optimised capacity for Airport Operator
- Reduced cost for Airspace Users

ENVIRONMENTAL BENEFITS

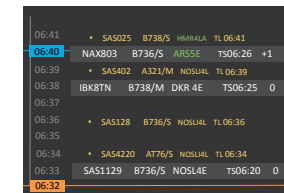
- Reduced queuing
- Lower fuel consumption
- Lower carbon dioxide emissions

This SESAR concept is validated at a number of European airports; Stockholm, Rome, Geneva and Barcelona.

Integrated Runway Sequence Function ensure quality in information exchange and increased collaboration between ATC, Airport operator and Airspace users.



Real time simulation in Stockholm-Arlanda environment performed by LFV (COOPANS). Integrated Runway Sequence for optimisation and balancing of arrivals and departures on single and parallel runways.

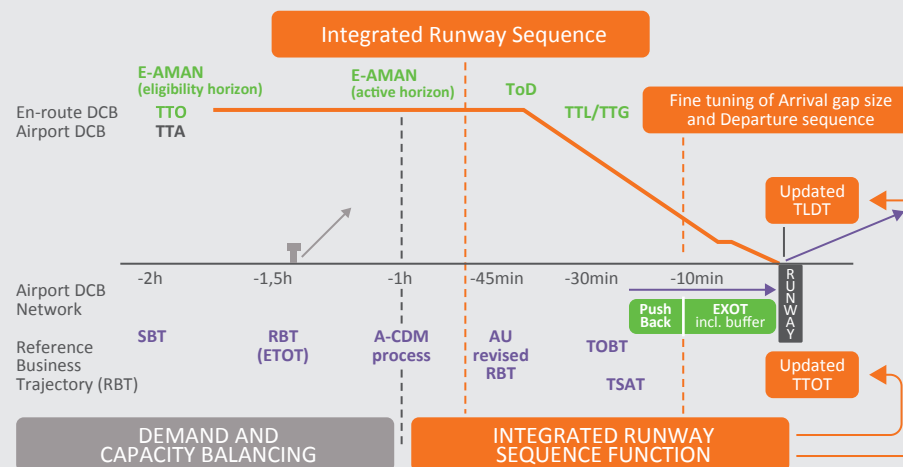


INTEGRATED RUNWAY SEQUENCE IN DMAN

Arrival SAS025 replanned to runway 19L.

Departure NAX803 replanned to runway 19L.

INTEGRATED RUNWAY SEQUENCE – SESAR OPERATIONAL CONCEPT



The Integrated Runway Sequence is planned before Arrival flights top of decent and linked with Airport CDM procedures for departures.

Fine tuning of Arrival and Departure target times is provided to ensure efficient runway throughput.