

Intelligent Approach™

Time and Distance Based Separation

Air passenger figures are set to double in the next 20 years. Inefficient final approach spacing is the single most constraining factor to runway capacity.

NATS and Lockheed Martin have pioneered a product suite that blends technology and ATC expertise to enable airports to optimise approach spacing for aircraft through both distance-based and time-based separation.

Distance Based Separation (DBS)

Assists the controller in ensuring the required safety separation whilst delivering efficient spacing.

Time Based Separation (TBS)

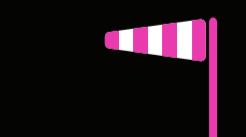
By dynamically calculating aircraft separations TBS safely reduces separation minima during certain wind conditions based on live wind data.

TBS in strong headwinds

Over 150,000 flights were analysed to understand the behaviour of aircraft wake vortices in strong headwinds. The results confirm the theory that wake vortices dissipate more quickly in strong headwind conditions.

This means that the distance between certain aircraft can be reduced and the time between landings can be kept similar to those arriving in light headwinds.

Time Based Separation (TBS) enables us to minimise the impact of strong headwinds on landing rates, thereby reducing delays and cancellations.



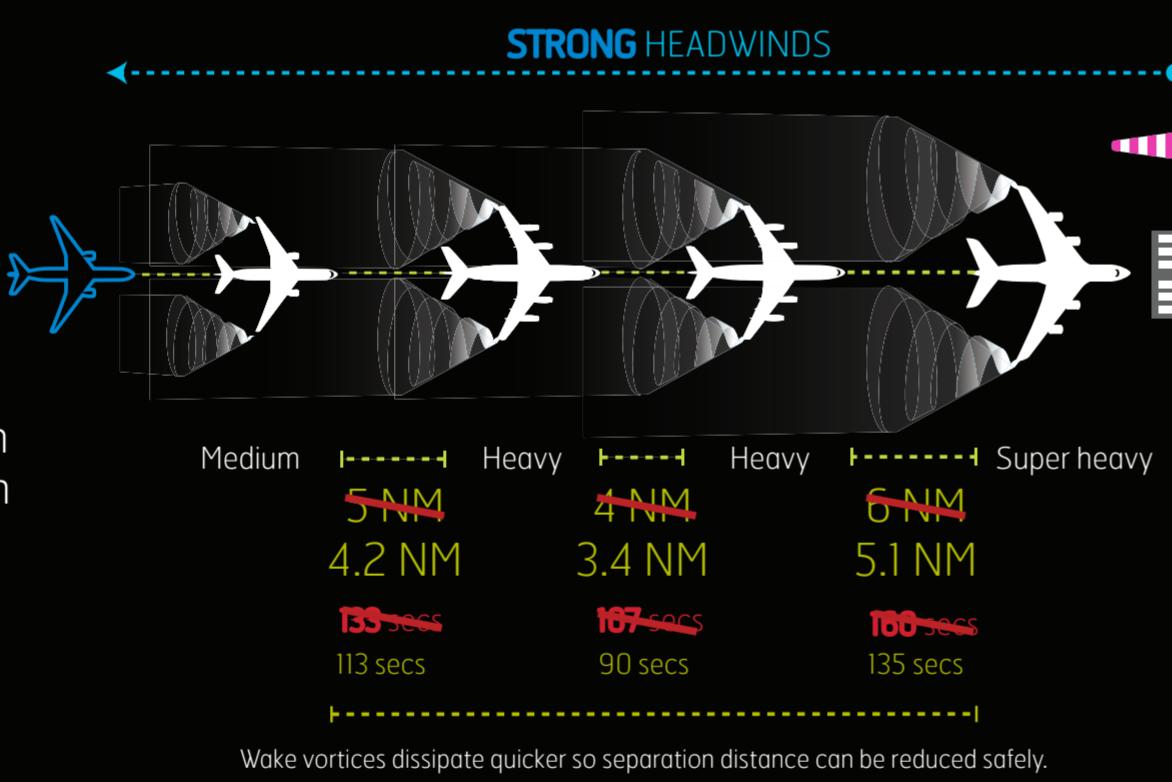
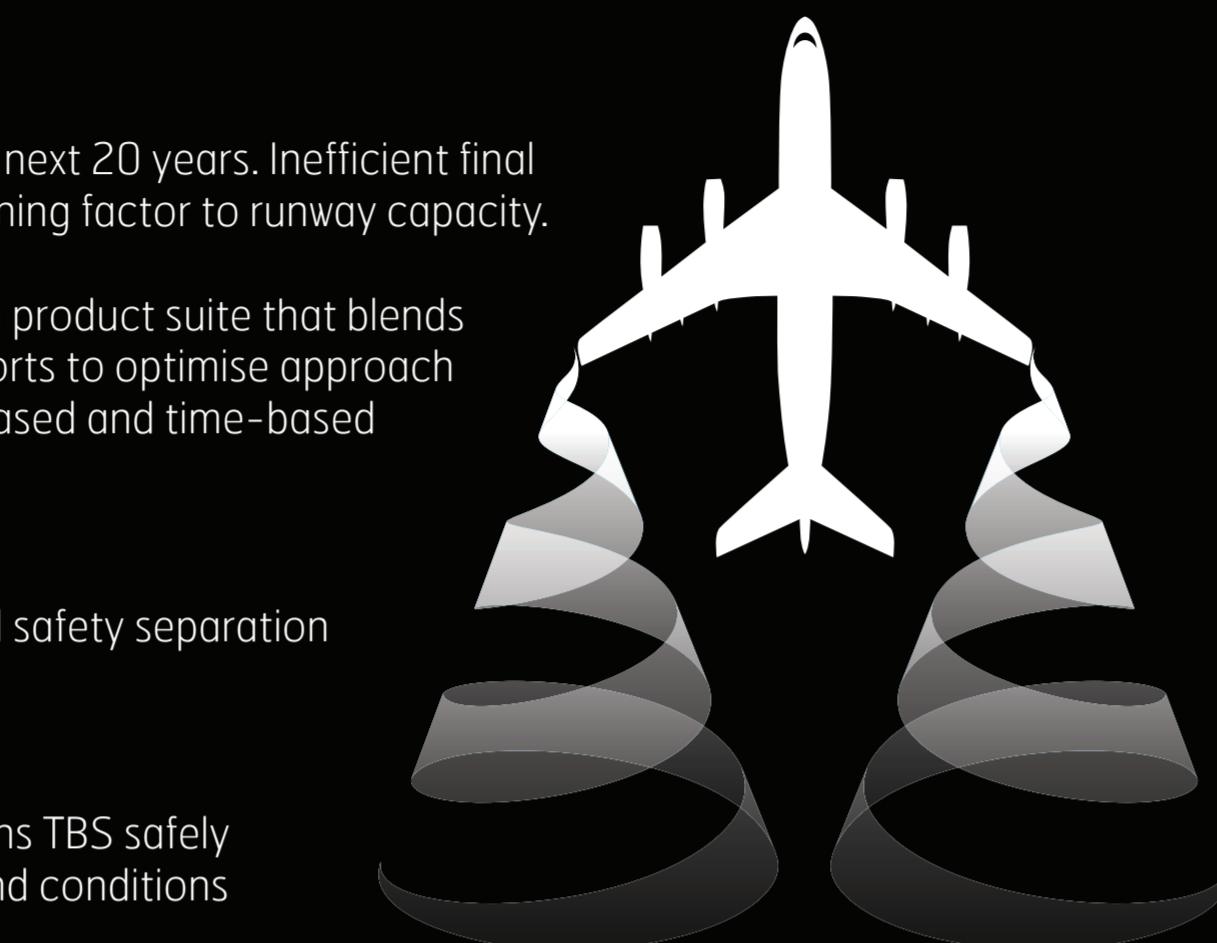
WINDSPEED

Strong headwinds



GROUND SPEED

Mean speed
130 Knots



SEPARATION

Dynamically calculated on headwind conditions.

$$\text{Landing rate} = \frac{36 - 40}{\text{Aircraft per hour}}$$

Benefits



High Performance ATC

Increased efficiency through consistent ATC delivery of approach spacing.



Intuitive Tools

User friendly controller support tool suite enabling enhanced performance.



Capacity Gains

Increase runway throughput to maximise the revenue delivered by your runways.



Assured Operations

Improved resilience in adverse weather. Improved safety - clear indication of safety minima for controllers.

Product Roadmap

Future developments of the approach optimisation suite include:



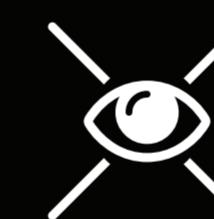
Mixed Mode Operations

Safely reduce the required inbound separation through integration with departure manager systems to take account of the aircraft runway occupancy on departure.



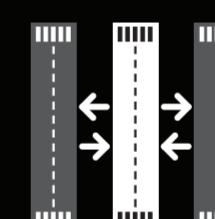
Pairwise Separation

Further optimising time based separation through adjustment to take account of the wake pairings of specific aircraft types. Moving from the current ICAO wake categories to RECAT 1 and then to RECAT 2 pairwise separation.



Low Visibility Procedures

To tailor the final approach spacing to the preceding aircrafts occupancy of the localiser sensitive area. This allows for runway occupancy optimisation in LVP conditions.



Dependent Runway Operations

Converging runways - final approach spacing will take cognisance of departures to ensure de-confliction of go-arounds.

50% reduction in wind related delays at Heathrow



The introduction of TBS at Heathrow is a world-first and will deliver major benefits to the airlines and the flying public.

Heathrow Airport is scheduled to 99% of its capacity, meaning any impact on landing rate can have major implications, namely delays and an increased chance of cancellations. Time Based Separation will reduce wind related delays by more than 50%.

Derek Provan, Director of Airside Operations at Heathrow Airport Ltd:

"The World's first implementation of Time Based Separation on final approach is about to go live at London Heathrow. Time Based Separation is a key part of Heathrow's Operational Resilience Plan & addresses the biggest single cause of arrival delays at Heathrow Airport."