NATS

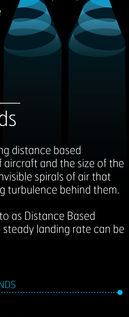
Performance through innovation

Time Based Separation at Heathrow

The biggest single cause of delay to Heathrow arrivals is strong headwinds on final approach.

A new system to separate arriving aircraft by time (Time Based Separation or 'TBS') instead of distance (Distance Based Separation or 'DBS') will significantly cut delays and reduce cancellations due to these strong headwinds.

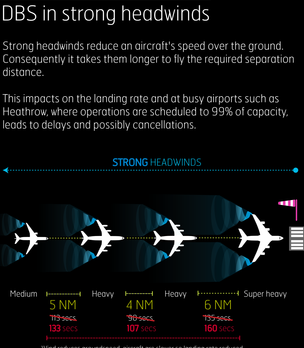
In what will be a world first, TBS will become operational in Spring 2015.



DBS in light headwinds

Traditionally, flights are separated using distance based standards dependent on the weight of aircraft and the size of the wake vortex they create as they fly - invisible spirals of air that trail from an aircraft's wingtips creating turbulence behind them.

This method of separation is referred to as Distance Based Separation (DBS). During light winds a steady landing rate can be maintained using this method.



WINDSPEED
Light headwinds

+

GROUNDSPEED
Mean speed 160 Knots

+

SEPARATION
Fixed on distance based standards

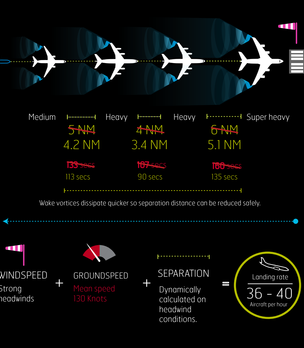
=

Landing rate
40-45
Aircraft per hour

DBS in strong headwinds

Strong headwinds reduce an aircraft's speed over the ground. Consequently it takes them longer to fly the required separation distance.

This impacts on the landing rate and at busy airports such as Heathrow, where operations are scheduled to 99% of capacity, leads to delays and possibly cancellations.



WINDSPEED
Strong headwinds

+

GROUNDSPEED
Mean speed 130 Knots

+

SEPARATION
Fixed on distance based standards

=

Landing rate
32-38
Aircraft per hour

WARNING A reduced landing rate can increase
DELAYS and Cancellations

TBS in strong headwinds

We've analysed over 100,000 flights 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) will enable us to minimise the impact of strong headwinds on landing rates at Heathrow, thereby reducing delays and cancellations.

WINDSPEED
Strong headwinds

+

GROUNDSPEED
Mean speed 130 Knots

+

SEPARATION
Dynamically calculated on headwind conditions.

=

Landing rate
36 - 40
Aircraft per hour

The comparison

DBS
Light headwinds
Landing rate
40-45
Aircraft per hour

DBS
Strong headwinds
Landing rate
32-38
Aircraft per hour

TBS
Strong headwinds
Landing rate
36 - 40
Aircraft per hour

Benefits

Landing rate

TBS will help maintain an efficient landing rate in strong headwinds.

Delay time

TBS will half delay time caused by strong headwinds saving approximately 80,000 minutes a year.

NOT CANCELLED

Cancellations

TBS will significantly reduce flight cancellations caused by adverse wind conditions. This will help the airport and airlines maintain a robust and reliable operation.

Find out more about NATS at nats.aero and nats.aero/blog