## HOW CACI BOOSTED HEATHROW'S DEPARTURE EFFICIENCY A NATS CASE STUDY





AN AWARD-WINNING NEW APPROACH TO AIRCRAFT STAND AND TAKE-OFF SLOT ALLOCATIONS HAS ENABLED HEATHROW TO BECOME MORE EFFICIENT.



Airport congestion is a growing concern – not least at Heathrow, where flight movements are capped at 98% capacity.

In fact, airport congestion is likely to only get worse across Europe as airports struggle to keep up with the growth in passenger demand and flight traffic.

Driven by the European Commission's Single European Sky initiative and Airport Collaborative Decision-Making (A-CDM), air traffic services provider NATS looked for a way to optimise aircraft stand and take-off slot allocations – enabling it to ease congestion and drive efficiency across ontime performance.

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'The Airport Collaborative Decision Making system ensures that the correct number & type of aircraft leave the gate and arrive at the runway at the right time. This increased throughput and reduced congestion. With the complexity of the operation at Heathrow, we needed to use the most advanced systems to deliver the benefits we were seeking and CACI provided just that.'

John Crook, Business Support Manager, NATS Heathrow.



#### **THE PROBLEM:** CONGESTION AND EMISSIONS AT EUROPE'S BUSIEST AIRPORT



Most major international hub airports have their fair share of congestion, but with no additional capacity available, air traffic controllers at Heathrow found it particularly difficult to manage gate allocation and departure slots.

Meanwhile, allowing aircraft to leave their stands for the taxiway only to find themselves idling in pre-departure congestion is inefficient and wastes money for the airlines via fuel burn. A 2019 article in Forbes estimated that this costs the industry  $\in$ 17 billion; while a study by SEO Amsterdam Economics and Cranfield University claimed that it pushes up air fares by more than  $\in$ 2 billion.

What's more, a multitude of other factors – such as wake turbulence, aircrew checklist completion times, weather, and ground services – each have the potential to cause minor delays. When you consider the limited room for manoeuvre in Heathrow's slot allocations, even a few seconds

on each departure can add up to cause delayed or even missed take-off slots.

NATS needed a solution that would help optimise the way it allocated its aircraft stands and take-off slots, which would also account for any variable that can add to taxiway congestion – a major cause of unnecessary taxi time at the airport.

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### THE SOLUTION: REAL-TIME FLIGHT INFORMATION COMBINED WITH A SINGLE VIEW OF THE AIRFIELD

To solve the issue, NATS worked with the University of Nottingham who are specialists in developing artificial intelligence and algorithms for ground air traffic control. CACI's Digital Solutions team developed the complex data integration, volume-tested and optimised in real time, using the University of Nottingham's AI. Together, we created the Target Start-up Approval Time predeparture sequencing system – a module of the A-CDM system – to help optimise Heathrow's departing flights.

By blending a wide range of variables with simulations and predictive analytics, the Airline Operations Plan now accurately forecasts flight movements and shares real-time status information with airport decision-makers, such as air traffic controllers and movement planners.

The new system has resulted in a shift from reactive workloads based on delays and aircraft positioning, to a proactive process where resources and scheduled events are matched against real-time variables. The result is a more efficient provision of aircraft stands and take-off slots.

Accurately forecasts flight movements and shares real-time status information with airport decision-makers

#### THE OUTCOME: IMPROVED PASSENGER SATISFACTION AND MILLIONS OF POUNDS IN FUEL SAVINGS

The results for NATS and Heathrow have been significant. Ground controller efficiency has been improved which has had a direct positive impact on airport operations.

100% of stands are now allocated 20 minutes before arrival

A reduction in aircraft gate and taxiway congestion means that 100% of stands are now allocated 20 minutes before arrival, enabling fewer flight cancellations, improved punctuality and better customer satisfaction.

By using Target Start-up Approval Time (TSAT) to maximise stand time before departure and delaying engine start, the solution has also enabled a 10% reduction in taxi times at the airport.

This isn't just good for Heathrow's ambitions plans for sustainable growth; it's also great for airlines and their passengers. That's why the project was one of the key factors when the Heathrow partnership won the 2019 Real IT Award for Turning Data into Insights.

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# **AVIATION'S EFFICIENCY** – THE TIME TO ACT IS NOW

Transforming airport efficiency isn't just about cost and customer satisfaction. It's also about the impact these changes can have on the environment and how aviation can be made more sustainable in the future.

In an age of unprecedented airport expansion, the solution has to come from tried-and-tested technology – like the proven impact of the Airline Operations Plan.



IF YOU'D LIKE TO FIND OUT MORE ABOUT OUR WORK WITH NATS OR HOW OUR TEAM CAN HELP YOUR BUSINESS, CONTACT US TODAY:

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