

# THE AEROSPACE TECHNOLOGY INSTITUTE'S WHOLE AIRCRAFT CAPABILITY

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The overall purpose of the Aerospace Technology Institute (ATI) is to support, promote and sustain the UK aerospace industry through targeted investment in research & technology (R&T).

As part of that, the Institute is responsible for defining the UK's Aerospace Technology Strategy and stimulating industry-led R&T projects that align with this strategy. One of the four priority value streams identified in the strategy is Whole Aircraft.

The ATI's Whole Aircraft team – with strong backgrounds in research, industry and operations – is responsible for providing whole aircraft impact assessments for research funding proposals, strategic guidance on future market and aircraft developments, and maintaining and developing the whole aircraft skillset within the UK.

The team is currently in the process of establishing a capability to model the performance and economics of conventional and less conventional transport aircraft, business aircraft, helicopters, general aviation and RPAS.

The conventional aircraft modelling is now functional using conceptual design tools of differing fidelity levels. This includes the Pacelab APD software with its knowledge capture capability and Excel-based aircraft scoping and operating economics tools. Further work is planned to enhance the capabilities of these tools. All are deliberately intended to avoid any intensive computing processes at runtime given the extensive database of existing conventional aircraft.

An engine performance model has also been developed to support this work. It provides suitable engine performance and ratings data (MTO, MCL, idle, fuel flow curves, etc) based on limited publically available data.

The less conventional aircraft capability is in development. It will use the same APD tool with extensions to the data model to consider various types of configurations. Development of aerodynamic and mass methods will use limited scope CFD/FE/MVO research studies or the results of literature searches to populate the data model with response surfaces. This capability will also be used to identify the necessary technologies and required improvements to deliver the necessary whole aircraft improvements to realise these configurations and assess their feasibility.

