

Key Objectives

The primary goal of INVENTOR is to better understand the physics of noise generated by **landing gears** and **high-lift devices**, thanks to a combined approach relying on specific experiments and advanced numerical methods. The ultimate goal is to decrease the external noise from business jet and short-medium range transport aircraft through the development of innovative low-noise installed landing gears and high-lift components as well as new promising noise reduction technologies, thus contributing to the achievement of the Flightpath 2050 goals pursued by ACARE SRIA on aviation noise, i.e., to reduce perceived noise emission of flying aircraft by 65%.



Examples of business jet (top : Falcon F7X) and small-medium range transport aircraft (bottom : A320) at approach, with landing gears and high lift devices deployed

Created with mapchart.net



INVENTOR : 16 partners from 7 EU countries :

- 3 industrial stakeholders (IND),
- 6 universities (UNI),
- 5 research centers (REC),
- 2 small-medium size enterprises (SME)



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<https://cordis.europa.eu/project/id/860538>

Project Coordination

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INnoVative DEsign of INstalled Airframe ComponentS For Aircraft NOise Reduction

To decrease the external noise from **business jet** and **short-medium range transport aircraft** through the development of low-noise installed **landing gears and high-lift components**

Duration

May 2020 – April 2024

For more info

<https://w3.onera.fr/inventor/home>



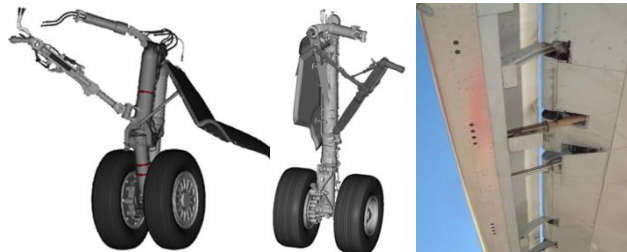
Reducing aircraft noise levels in airport areas is a challenging priority, since noise pollution poses a high risk to human health, topping priorities of policy makers and, thus, driving significant industrial challenges for aircraft manufacturers.

Aircraft are especially noisy during approach and landing, when engines are operated at low regime, with the consequence that **high-lift devices** (slats, flaps) and **landing gears** are the dominant noise sources in these flight configurations.

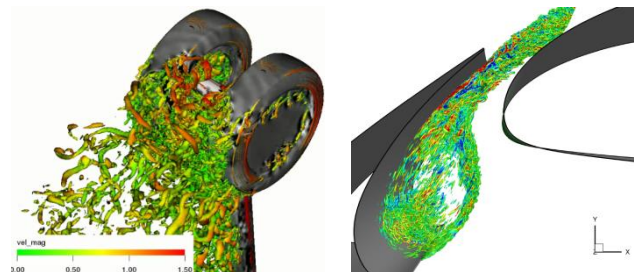
INVENTOR project will study the physics of noise generated by landing gears and high-lift devices at landing/approach and develop innovative **low-noise installed landing gear and high-lift components** and **noise reduction technologies**, in order to lower external noise from business jet and short-to-medium-range transport aircraft.

Approach

- Select the most promising active and passive noise reduction technologies and low-noise designs for landing gears and high lift devices
- Assess them via experiments in small/middle/large scale facilities :
 - from generic airframe components to full generic aircraft model,
 - including realistic aerodynamic/acoustic installation effects.
- Use/improve up-to-date Computational Fluid Dynamics and Computational AeroAcoustics techniques to simulate these configurations
- Validate the numerical tools against the experimental databases
- Assess results at aircraft level
- Extrapolate results at full scale



Landing gear architectures (left) and slat actuation and de-icing systems (right) studied in INVENTOR



Numerical simulations of unsteady flow (noise sources) of generic landing gear (left) and slat region (right)

INVENTOR partners

AIRBUS

SAFRAN
LANDING SYSTEMS

DASSAULT
AVIATION

UNIVERSITY OF
Southampton

RWTHAACHEN
UNIVERSITY



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin



University of
BRISTOL

CHALMERS



TU Delft
Delft University of
Technology

ONERA
THE FRENCH AEROSPACE LAB



von KARMAN INSTITUTE
FOR FLUID DYNAMICS

CERFACS

ERDYN
Anticipate
Act Assess

upstream
CFD