

# Institute of Sound and Vibration Research

Since its foundation in 1963, the ISVR has become widely acknowledged as one of the world's foremost centres for the study of sound and vibration phenomena. Its achievements have been based upon success in key areas:

## Education

The ISVR is unique in its ability to offer undergraduate and postgraduate degree programmes and continuing professional development in a comprehensive range of subjects related to sound and vibration. Short courses are offered to industry on a regular basis, with tailor-made options available on request.

## Research

The ISVR is a centre for postgraduate and postdoctoral research in most areas related to sound and vibration. It has a number of research groups covering an extensive range of subjects, including acoustics, structural dynamics, human sciences, audiology, fluid dynamics, vehicle dynamics, signal processing, active noise and vibration control and instrumentation.

The ISVR is renowned for its contributions to both reducing aircraft noise and understanding how humans respond to it so its effect on communities near airports can be assessed.



### Find out more:

[www.southampton.ac.uk/engineering/research/centres/isvr.page](http://www.southampton.ac.uk/engineering/research/centres/isvr.page)

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# DRONE NOISE A TECHNICAL & REGULATORY CHALLENGE



How ISVR researchers at the University of Southampton are working to overcome the challenges posed by drone noise.

## Drones – an opportunity and a challenge

Currently drones are small and not that common, but as their potential to deliver benefits to society starts to be realised they will grow in both size and number. Inevitably, this will entail a greater noise impact which and poses the serious risk of a public backlash if not properly managed.

Are regulators, politicians and society at large prepared to deal with this new branch of aviation that is still unregulated for noise? Drones are currently designed for performance: the literature suggests that there is little consideration given to the noise implications of current technology. Additionally, operational controls for ATM safety reasons mean that the ceiling for operation is 120m and drones are kept only 50m from people and private property. This adds up to a potential noise nuisance, let alone the privacy and safety considerations.



## Drone noise – more than a technical challenge

Understanding the mechanisms that produce drone noise is essential if they are to become quieter, and academics at the University of Southampton are applying their experience of aircraft noise to do just that. However, there is another problem.

The tones generated by drones are generally different from those we associate with commercial aviation and arguably are at frequency levels that will cause greater annoyance to the listener. The greater visual intrusion of drones will exasperate this.

The aim of researchers is to develop models for how the noise relates to the design and operation of the drone and subsequently recommend appropriate metrics for quantifying the public response. This will provide politicians and regulators with the information they need to ensure the control of drone operations balances the interests of operators and those on the ground affected by drone noise.

## Drone noise – looking ahead

The future for electrically powered unmanned aviation is an exciting one and several manufacturers are already planning larger vehicles such as air taxis. These aircraft will bring new problems: how do we decide what routes they are allowed to fly? How will the noise footprint be affected by reflections from buildings? What is the right way of assessing their noise in an already noisy urban environment?

The academics at the university already have an eye on these problems. The tools, methods, and expertise we already have for assessing conventional aircraft noise will be supplemented by our work on drone noise to develop a suite of methods for urban aviation vehicles.

