

## **46ESS-40: Civil Aircraft Noise Reduction Systems**

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*Over the past sixty years, civil aircraft noise has steadily decreased thanks to engine and airframe architecture evolutions. For instance, the introduction of higher and higher bypass ratio turbofan engines has resulted in a tremendous reduction of jet noise. Nevertheless, noise annoyance is a cumulative phenomenon which grows with the number of operations per day. Therefore, to face the annual airport traffic growth (3% to 4% per year) and meet high expectations from people living in the vicinity of airports, noise regulations are increasingly stringent. As a result, aircraft and engine manufacturers pursue their efforts to make quieter airplanes even if further reduction becomes more and more challenging.*

*The aim of this paper is to provide an overview of civil aircraft noise reduction systems. It starts with some fundamental notions about noise, sound waves and units. Then, it gives an insight into the regulation framework at international and airport level. After diagnosing in detail the two major noise sources (engine and airframe), it covers a wide range of current noise reduction technologies. Finally, the article provides some future trends in terms of aircraft noise mitigation.*