The Environmental Cost of Aircraft Noise and Engine Emissions

Recent research has evaluated the environmental costs of both aircraft noise and engine emissions at different sized airports in Europe. The total environmental costs have been estimated to range from €11 million to €645 million per year depending on the airport size and traffic and operation characteristics. The results and methodology of environmental cost calculations presented in the paper could be applied to the proposed EU harmonised noise charges as well as to other social and economic benefit analyses of airports.

Over the past decades, increasing attention has been paid to the sustainable development of the aviation sector. Two of the most important environmental impacts generated from commercial flights are noise nuisance and aircraft engine emissions. It is now generally recognised that the cost of the environmental impacts (externalities) must be paid by the aviation industry and its users. An assessment of the real costs of the social and environmental impacts is crucial for the European Union’s policy of strengthening market incentives to improve environmental performance and the EC’s proposal for potential harmonised noise charges.

A new study provides a framework in which to assess the environmental costs of airport operations. The methodology developed in the research to calculate the emissions and noise in terms of monetary costs was applied to different sized European airports, ranging from hub airports to small regional airports.

The results suggest that the larger the volume of aircraft movements, the higher the environmental costs. The authors also observed that adding a certain amount of traffic to a hub airport would cause more environmental damage than at a regional airport.

Of the five airports studied, Heathrow has the highest noise and engine emission social costs (€1,779 per landing), which is the result of its large number of aircraft movements and high population affected by noise. With a high volume of aircraft movements and a large surrounding population, Schiphol has lower noise and engine emission social costs (€1,219 per landing) than Heathrow. Maastricht has higher noise costs than Gatwick and Stansted but fewer emission costs. The aggregated costs of noise and engine emissions were calculated to be €651, €492 and €237 per landing for Gatwick, Stansted and Maastricht respectively.

The results and the methodology used to calculate aircraft noise and engine emission costs presented in this study can be used to determine the proposed European noise charge levels. By expanding this analysis to other airports and factors, policy makers would be able to determine the equilibrium of an airport system and to assess the environmental impacts of any airport expansion plans and traffic forecasts. The environmental cost analysis can also be compared with the social and economic benefits of an airport in order to determine the relationship between the airport and the surrounding region.


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