Assessing Aircraft Noise Conditions Affecting Student Learning - Case Studies

ACRP Staff Comments: ACRP Project 02-26, Assessing Aircraft Noise Conditions Affecting Student Learning, includes case studies; any additional case study analysis would have to complement this existing research.

TRB Aviation Group Committees Comments: ENVIRONMENTAL IMPACTS OF AVIATION: Support. This is an important issue, and certainly one with policy and cost implications.

Review Panel Comments: Recommended.—Case studies would provide needed depth of understanding of this important issue.
I. PROBLEM TITLE
Assessing Aircraft Noise Conditions Affecting Student Learning – Case Studies

II. RESEARCH PROBLEM STATEMENT
Community concerns over the effects of noise on children’s learning present potential barriers to airport expansion and can contribute to delays in capacity improvements. There is evidence that chronic exposure to noise is associated with reading deficits in children. The FAA awards grants to insulate public schools based on a criterion of Day-Night Average Sound Level (DNL) 65 dB in order to mitigate the effects of aircraft noise on student learning. However, to date there is no data to determine whether this criterion is appropriate for identifying aircraft noise impacts on schools.

In 2010 ACRP began research on “Assessing Aircraft Noise Conditions Affecting Student Learning” (ACRP 02-26) to identify whether the DNL 65 dB criterion is appropriate for identifying noise impacts on schools. ACRP 02-26 is a nationwide macro-analysis of the relationship between noise exposure and student performance taking into account the effect of school sound insulation and other confounding factors. The research relies on student test scores as a measure of performance. The research does not however, examine the effects of aircraft noise on student/teacher interactions. Classroom observations are needed to determine at what level noise events cause interruptions and how student and teacher communication and behavior is affected by aircraft noise. This would enable a more refined approach to developing the most appropriate metric and criteria for determining the effect of aircraft noise on classroom learning.

III. OBJECTIVE
This problem statement proposes the development of a classroom case study design for classroom observations needed to develop the most appropriate metric and criteria for determining the effect of aircraft noise on classroom learning. A pilot case study of 3 schools is also proposed.

IV. RESEARCH PROPOSED
1. Case Study Design
This work would focus on developing a plan for the classroom observations including the types of observations to be made such as, teacher pauses, teacher speech masking, pupil speech pause and masking, classroom behavior, and pupil distraction and how they would be characterized. The plan would determine what, if any, teacher and student interviews would be performed, and what permissions would be required to perform the observations. The plan would also include what types of noise measurements would be made and how the data would be collected, the locations of the noise measurements, and the types of metrics to be studied.

2. Pilot Case Studies

This work would focus on the selection of the most appropriate schools for initiating the case studies. Case studies for the selected schools would be performed as per the study design developed in (1.). Data would be collected and analyzed and results reported including recommendations for future case studies.

V. ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD
Recommended funding  $600,000
Research Period:  24 months

VI. URGENCY AND PAYOFF POTENTIAL
Community concerns over aircraft noise exposure continue to grow, especially over the effects of noise on children’s learning. Recent research suggests that noise may directly affect reading comprehension and learning motivation. Currently there is no data to determine whether this criterion is appropriate for identifying noise impacts on schools. Obtaining such data will lead to better informed decisions on how best to mitigate the effects of aircraft noise on student learning.

VII. RELATED RESEARCH
This research would be follow-on to the ACRP 02-26 project “Assessing Aircraft Noise Conditions Affecting Student Learning”.

VIII. PERSONS DEVELOPING THE PROBLEM
Rebecca Cointin
Manager, Noise Division, Office of Environment and Energy
FAA

IX. PROCESS USED TO DEVELOP PROBLEM STATEMENT
The process used to develop the problem statement was a review of prior work and recommendations on student learning as well as consultation with Office of Environment and Energy staff.
X. DATE AND SUBMITTED BY

Catherine M. Lang
Deputy Associate Administrator for Airports
FAA