



Aircraft Noise and Emissions Mitigation

Research to Examine Land Use Decisions and their Relations to Airport Noise Concerns and Complaints

Research Airports

Cleveland-Hopkins International Airport

San Jose International Airport

Manassas Regional Airport

Air commerce is an important and necessary factor in today's economy whether it supports large city business or engenders vacation travel or leisure community development. As an integral part of local and regional economies, airports must find a way to peacefully coexist with their surroundings. At the same time, if airports are to be effective at providing for the travel and commercial needs of local and regional populations, they must be accessible and provide a wide range of services.

The proposed research activity endeavors to assess how incompatible land use around airports fuel noise concerns and complaints. This study explores the developmental history of the airports as well as the land use surrounding their location. Attention will continue to be given to operational patterns such as approach and

departure corridors, times of peak operation, changes in the operational nature of the airport over time as well as correlative changes in noise issues, concerns and complaints.

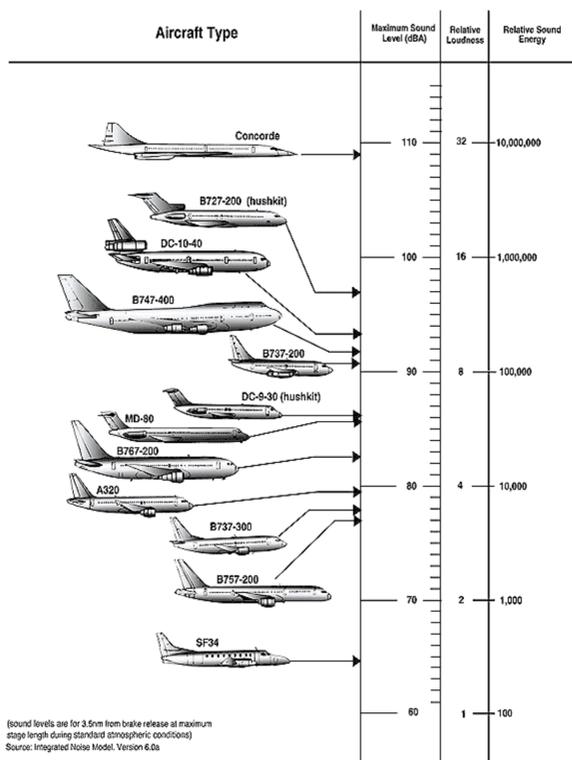
During this phase of the study, the Co-Principal Investigators and research team will work closely with airport administrators, civic leaders, and aviation organizations to collect salient data concerning the most prominent issues leading up to and precipitated by incompatible land uses around their airport. Analysis of past data, interviews and focus groups will be used in order to better understand the wider issues. The research population will be expanded to include individuals who also live in high noise complaint areas but choose not to complain about airport related noise. These individuals' perspectives will provide a balance to the noise complaint data and will help researchers understand the dynamics of why some individuals complain about airport noise while others do not.



Technological Advances

A new 777 can make less than 1/10th the noise on departure as a 727-200, yet it carries more than twice the number of passengers.

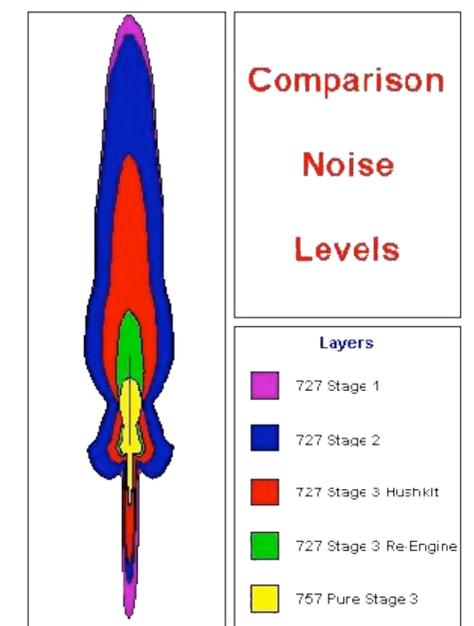
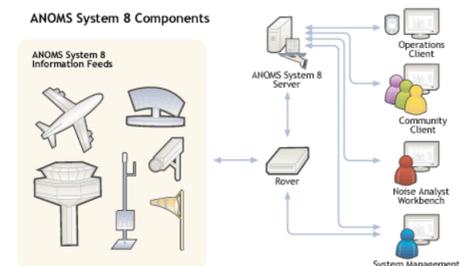
—ACI-NA



The decibel rating system is based on a logarithmic scale. In essence, sound pressure increases by powers of ten on the decibel scale. For instance, 10 decibels is 10 times more powerful than 1 decibel, 20 decibels has 100 times more energy than 1 decibel, and 30 decibels is 1,000 times more powerful than 1 decibel.

Sound Pressure Level (dBA)	Source	Sensation
130	Jet Aircraft at 100' Bass Drum at 3' Auto Horn at 3'	Physical Pain
120	Thunder, Artillery Nearby Riveter	Deafening
110	Elevated Train Discotheque	Very Loud
100	Loud Street Noise Noisy Factory	Very Loud
90	Truck Unmuffled Police Whistle	Very Loud
80	Cocktail Party Noisy Office Average Street Noise	Loud
70	Average Radio Average Factory	Loud
60	Noisy Home Inside General Office	Moderate
50	Conversation Quiet Radio	Moderate
40	Quiet Home Private Office	Faint
30	Empty Auditorium Quiet Conversation	Faint
20	Rustle of Leaves Whisper Soundproof Room	Very Faint
10		Very Faint
0	Threshold of Audibility	

The decibel scale ranges from zero to 130 decibels. The threshold of audibility is at zero decibel and the threshold of physical pain for the human ear is at 130 decibels.



These noise footprints compare the area affected by a single departure under typical operating conditions of an original 727, two different recertified versions of the same aircraft, and a 757 which is manufactured as Stage 3.

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