



Hot Topics in Aircraft Noise

Florida Airports Council
Environmental and Noise Conference
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- **FAA Re-Authorization, Vision 100**
- **Stage 4 Noise Rules**
- **FAA's Center of Excellence for Aircraft Noise and Emissions Research**
- **FICAN: Results of the FICAN Schools Study**
- **FAA Environmental Policy (1050.1E)**
- **New Standards for Designing Airport Noise Monitoring Systems (SAE ARP 4721)**
- **National Response to Non-Stage 3 Aircraft**

FAA Reauthorization Vision 100 Summary

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- **Passed in December 2003**
- **Major purpose is to set funding for FAA programs (AIP)**
- **Addresses noise outside DNL 65 dB**
- **Includes some Part 150-related provisions**
- **Addresses streamlining**

FAA Reauthorization Vision 100 Summary

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- **Noise Compatibility Funding**
 - Increases “noise set-aside” of AIP discretionary authorization from 34% to 35%
 - “Noise set-aside” now includes air quality
 - Majority of funds have historically gone to land-use related compatibility projects
 - Also funds abatement measures

FAA Reauthorization Vision 100 Summary

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- **Funding Outside 65 dB DNL**
 - Prohibits FAA from approving compatibility programs that call for expenditure of AIP funds to mitigate noise below 65 dB DNL
 - So-called “Lott Amendment”
 - FAA has formally interpreted that it does not apply to previously approved programs or programs funded through PFCs

FAA Reauthorization Vision 100 Summary

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- **Other Part 150 Related Provisions**
 - Directs FAA to study concept of establishing a national program to disclose noise impacts to potential home buyers
 - Directs FAA to make Noise Exposure Maps available on FAA website
 - Requires Noise Exposure Map updates if contours *shrink* substantially

FAA Reauthorization Vision 100 Summary

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- **Environmental Streamlining**
 - FAA shall encourage capacity enhancement projects at congested airports
 - FAA has officially designated Fort Lauderdale – Hollywood International as a congested airport
 - Expedited, coordinated review process
 - Administrator may require flight procedures to mitigate noise impacts of capacity enhancement projects including new or reconfigured runways
 - Airport may fund FAA staff or consultants to assist in expediting reviews

New Stage 4 Noise Standard

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- **Proposed December 2003**
- **Parallels work at ICAO**
- **Would require that aircraft manufactured after 2006 meet new standard**
- **Standard is 10 dB total reduction (takeoff, approach, sideline)**
- **All currently manufactured aircraft meet this standard**
- **Not associated with any Stage 3 phaseout**

FAA Center of Excellence for Aircraft Noise Mitigation

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- **Goal:**
 - Identify and better measure the issues and impacts of aircraft noise and aviation emissions, and generate improved solutions to deal with these problems
- **Scope of Work:**
 - Socio-economic Effects of Noise and Emissions Impacts and Mitigation
 - Noise and Emissions Abatement Flight Procedures
 - Compatible Land Use Management
 - Airport Operational Controls
 - Atmospheric and Health effects of emissions

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Members:

- MIT (Lead)
- Boise State Univ.
- Florida Intl Univ.
- Penn State Univ.
- Purdue Univ.
- Stanford University
- Univ. of Central Florida
- Univ. of Missouri-Rolla

Sponsors:

- FAA
- NASA
- Transport Canada

Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER)



- **Low Frequency Noise Study**
 - Address low frequency noise – obtain measurements and annoyance data – formulate models to facilitate developing impact metrics and mitigation techniques
- **Noise Measurements, Metrics, and Health Effects**
 - Correlate metrics to community response and investigate role of noise characteristics in annoyance
- **Valuation and Trade-Offs of Policy Options**
 - Valuate aviation environmental costs and assess relationship between policies and environmental impact

- **Continuous Descent Approach**
 - Develop and evaluate candidate procedure and controller tools and certify low noise approach procedure at Louisville International Airport
- **Aircraft Operations and Air Traffic Control**
 - Enable widespread implementation of noise abatement procedures, by: evaluating existing noise abatement procedures; determining the impact of weather; developing candidate procedures
- **Land Use and Airport Controls**
 - Evaluate effectiveness of sound insulation, assess encroachment issues, and examine land use versus airport controls to provide information to enhance land use practices around airports

- **Quiet Rotorcraft and Short Field Operations**
 - Improve helicopter/tilt-rotor noise models; develop helicopter/tilt-rotor take-off and approach operations for reduced noise
- **Supersonic Transport**
 - Assess applicability of existing noise metrics to sonic boom and determine annoyance of low boom waveforms to inform future decision making regarding supersonic flight over land
- **Emissions Measurements & Health Impacts**
 - Collect particulate matter data using Light Detection and Ranging (LIDAR) to provide data to enhance dispersion analytical models

FICAN:

Effects of Aircraft Noise on Children's Learning

<http://www.hmmh.com/>

- **FICAN Members**

- Department of Defense (USA, USN, & USAF)
- Department of Interior (NPS)
- Department of Transportation (HQ & FAA)
- Environmental Protection Agency
- National Aeronautics and Space Administration
- Department of Housing and Urban Development



Study Overview: Research Questions

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- **Is aircraft noise reduction within classrooms related to test-score improvement, after controlling for demographics?**
- **Does this relationship vary by:**
 - Age group (high, middle and elementary school)
 - Student group (IEP and non-IEP)
 - Test type (verbal and math/science)

Study Overview: Airports and Schools

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- **Identified 3 airports:**
 - In states with publicly available (electronic) test scores
 - Reduction in aircraft noise, due to airport closure, or school sound-insulation programs
- **Picked 32 nearby public schools:**
 - Excluded non-public schools, because they are not required to give state-standardized test to all their students.
- **No guarantee that these airports/schools are representative**

Summary of All Results

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- **Substantial association between noise reduction and decrease in failure rates, only for high-school students**
- **Weaker association between noise reduction and increase in failure rates, for middle and elementary schools**
- **Little distinction between IEP and non-IEP students, and between verbal and math/science tests**
- **Little association between noise reduction and changes in “A” rate or average scores**

Recommendations for Any Follow-up Studies

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- **Airports/schools:**
 - Include larger number of airports and schools.
- **Students:**
 - Follow individual students from year to year, rather than using only class-average results.
- **Testing location:**
 - Identify tests taken in quieter environments.
- **Portable classrooms:**
 - Identify classes taught in portable classrooms.
- **Precision of noise computations:**
 - Obtain airport data directly from airports.
 - Incorporate outdoor-to-indoor measurements.

FAA Regulations – Order 1050.1E

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- Updated (and greatly expanded) list of categorical exclusions – *no* environmental review needed
- Additional guidance on air quality
- Additional guidance on supplemental noise metrics
- Special treatment for parks and other noise-sensitive areas
- See also Order 5050.4A for airport projects

New Standards for Designing Airport Noise and Operations Monitoring Systems

<http://www.hmmh.com/>

- **SAE A-21 Committee**
- **Update of Standards for Designing Airport Noise and Operations Monitoring Systems**
- **Working group includes FAA/NASA, monitoring system vendors, consultants, airports**
- **Goal: to update standards to include rigorous performance testing**

ARP 4721: Post-installation Testing

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- **Performance testing includes range of tests:**
 - Number of tracks w/ matching events
 - Number of events w/ matching tracks
 - Arrival operations vs. Departures operations
 - Tracks / events w/ no identified AC
 - Operations w/ no runway
 - Graphics

Metric	Description
1. Track Capture Ratios	Ratio of system captured tracks to alternative counts of tracks
2. Track Matching Ratios	System success at capturing and matching tracks to: Runway, aircraft, flight no.
3. Aircraft Event Capture Ratios	Ratio of aircraft events captured by the system to alternative estimates, counts or measurements of events
4. Aircraft Event Matching Ratios	Ratio of system events correctly identified by flight corridor, runway, ac type, flight no. to observed numbers
5. Aircraft Sound Level Uncertainty	Uncertainty of system measured levels when compared with alternative measurements – SEL, DNL
6. Track Position Uncertainty	Relation of system location to measured slant distance, GPS flight tracks.

National Response to Non-Stage 3 Aircraft

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- **Growing concern that nothing is being done about Stage 1 and Stage 2 aircraft**
- **Coalition is emerging to develop a national solution, in the form of federal legislation requiring replacement or retrofit**
- **Coalition forming to promote national response; looking for other interested parties**
- **See Dan Reimer's presentation tomorrow**
- **Briefing paper**



Questions?

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