

Extracts from SESSION 15 – THE LAW OF AIRPORT NOISE 101

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Session Overview

- Legal Authority

- What are the noise standards for aircraft types?
- How are these aircraft types regulated?
- How do we measure aircraft noise impacts?
- Can I get federal funding for noise mitigation?
- Can I impose noise restrictions at my airport?

Note: Original session included introduction to noise terminology, which has been removed for brevity.

Legal Authority - Statutes

- **Aircraft Noise Abatement Act of 1968 (49 U.S.C. 44715)**
 - FAA may prescribe standards for measurement and regulation of aircraft noise
- **Aviation Safety and Noise Abatement Act of 1979 (ASNA) (49 U.S.C. 47501 et seq.)**
 - FAA may regulate “air noise compatibility planning”
 - FAA may fund airport projects in an approved noise compatibility program
 - FAA may establish standards for measuring noise impacts
- **Airport Noise and Capacity Act of 1990 (ANCA) (49 U.S.C. 47521 et seq.)**
 - Phase-out of Stage 2 aircraft > 75,000 pounds
 - Limits on any restrictions of Stage 2 and Stage 3 aircraft
- **FAA Modernization and Reform Act of 2012 (P.L. 112-95)**
 - Ban on almost all Stage 2 aircraft after December 31, 2015

Legal Authority - Regulations

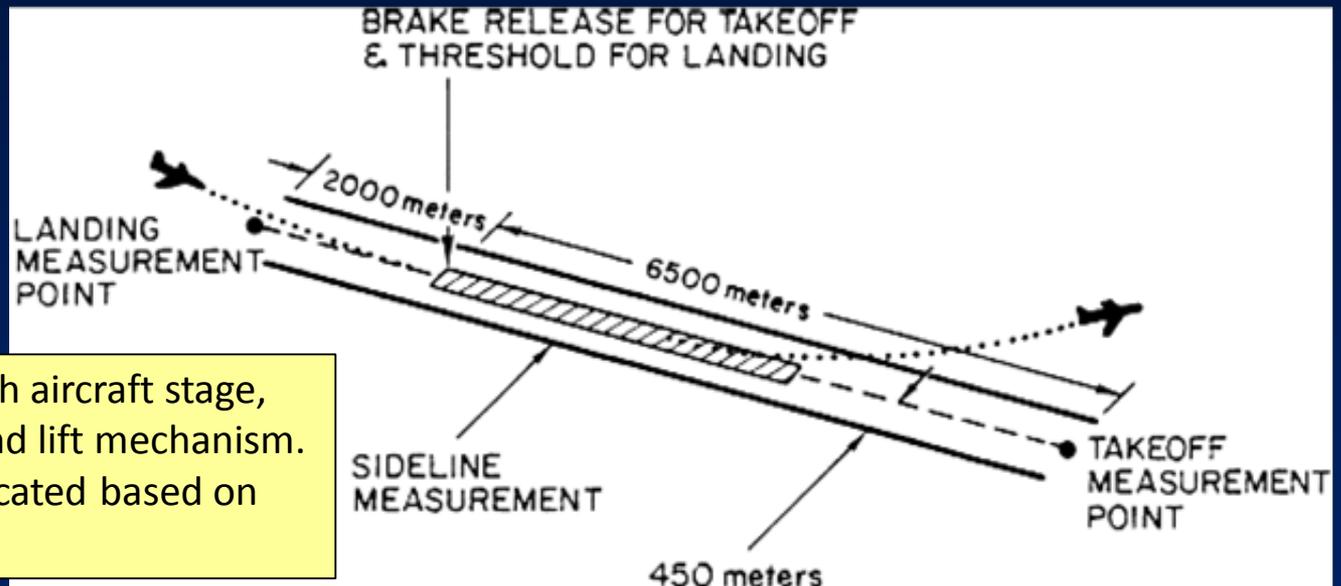
- **Part 36**
 - Noise Standards: Aircraft Type and Airworthiness Certification (1969, as amended)
- **Part 91, Subpart I**
 - Operating Noise Limits (1976, as amended)
- **Part 150**
 - Airport Noise Compatibility Planning (1984, as amended)
- **Part 161**
 - Notice and Approval of Noise and Access Restrictions (1991)

Aircraft Noise Abatement Act of 1968/ Part 36: Noise Standards

- Noise standards for newly certified aircraft types and designs
- Aircraft must meet standards to obtain certificates to operate in the U.S.
- Noise standards for most aircraft are in terms of “stages”
 - Caution: *The meaning of stage levels varies among categories!*
- Standards vary with “design” criteria, including (in part):
 - Subsonic versus supersonic speed capabilities
 - Type of propulsion (e.g. turbojet- or propeller-driven)
 - Weight (e.g., “small” or “large” aircraft under or over 12,500 pounds)
 - Rotary-winged versus fixed-wing aircraft
 - Operating category (e.g., “acrobatic,” “agricultural,” “commuter,” etc.)
 - Use (e.g., “fire fighting” or “carrying external loads”)
 - Date of initial flight or of application for type certificate

Part 36: Noise Standards

- Heavier aircraft are allowed to make more noise
- Certification for most – but not all – fixed-wing aircraft is based on three measurements
 - Landing, sideline, takeoff



Locations can vary with aircraft stage, number of engines, and lift mechanism. Some types are certificated based on level flyover.

Part 36 “Stages”

- Most relevant for civil subsonic jets and large transport-category (over 12,500lbs.) props
- “Stage 1” aircraft have never been shown to meet any noise standards
 - Either never tested, or tested and failed
- “Stage 2” aircraft meet original (1969) limits
- “Stage 3” meet more stringent (1977) limits
- “Stage 4” meet newest (2006) limits
- ICAO is considering “Stage 5”

Improvements in Aircraft Noise Technology

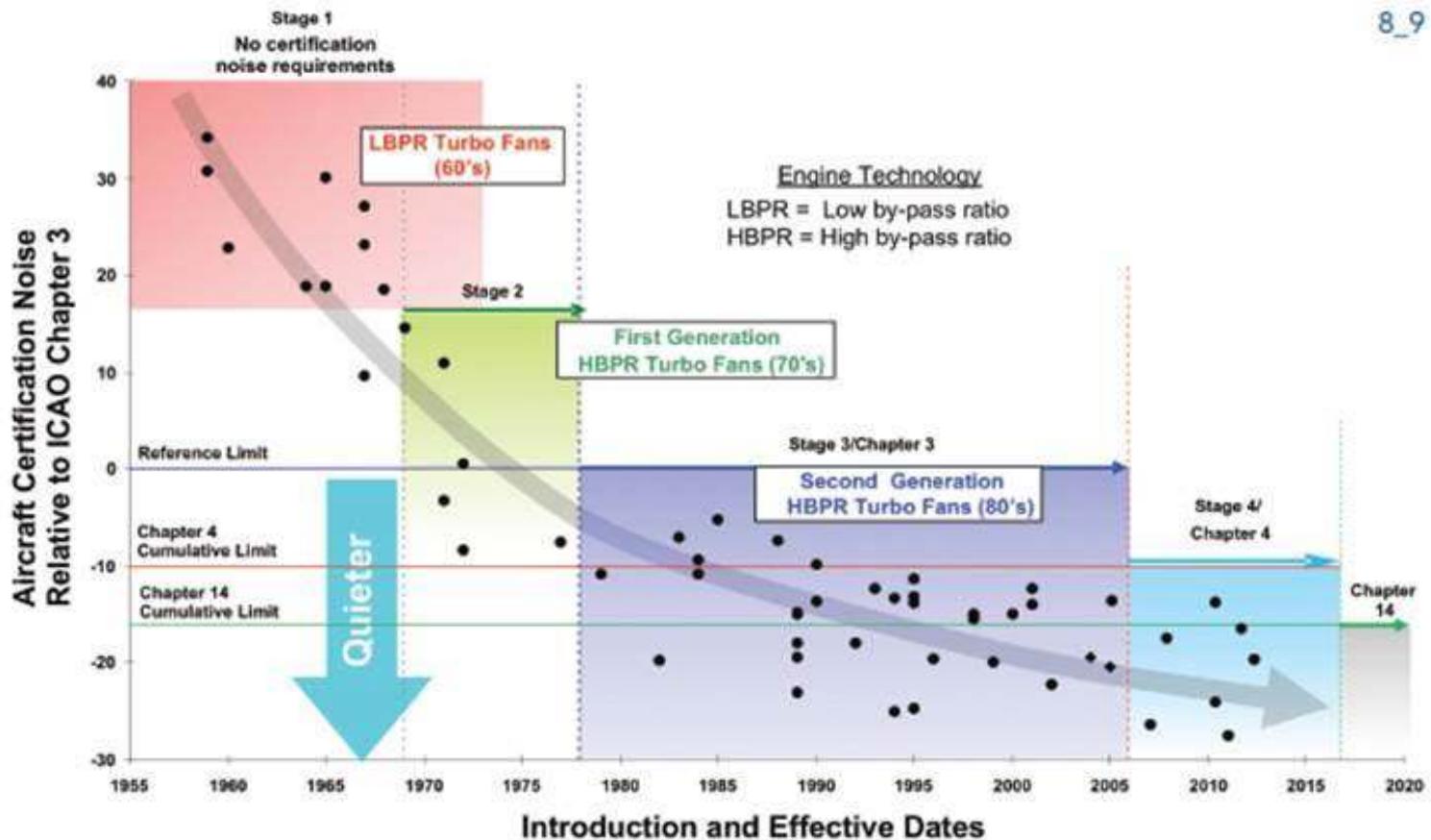


Figure 1 – Progress in commercial aircraft noise reduction, 1955-2015 (Source: Boeing)

Part 91 (Subpart I): Phases out older, noisier jets

- Stage 1 airliners (over 75,000 pounds) phased out in 1980s
- Stage 2 airliners phased out in 1990s
- Stage 1 and 2 jets under 75,000 pounds phased out by 2016
- No Stage 3 phase out planned at this time
- Some Stage 2 jets were “hushkitted” to meet Stage 3

High-Bypass Engine Typical on Modern
Stage 3 or 4 Aircraft



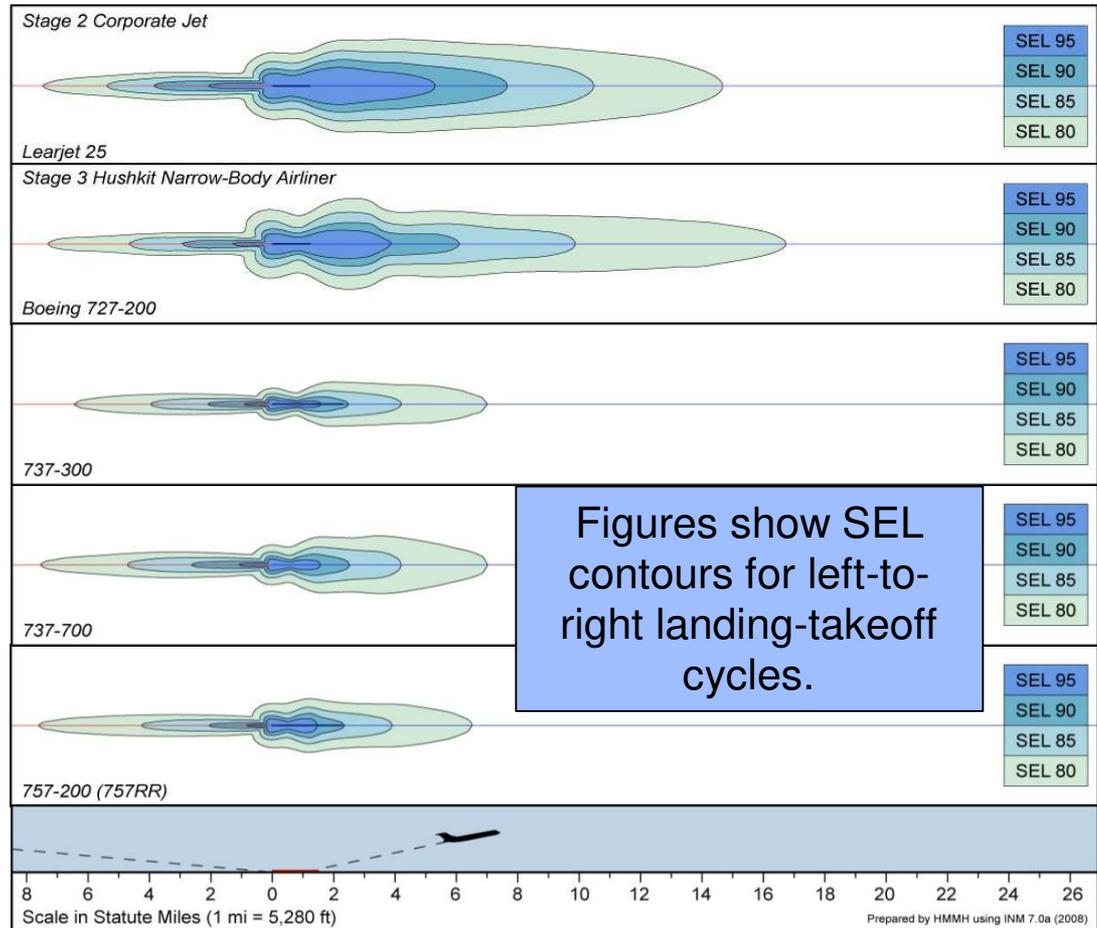
Typical Hushkitted Engine



Graphic example: Relative noisiness of Stage 1 - 4 aircraft

- Lear 25 corporate jet
 - Stage 1 or 2
 - 7,500 lb. MGTOW
- Boeing 727-200
 - Stage 3 hushkit
 - 180,000 lb. MGTOW
- Boeing 737-300
 - Early "true" Stage 3
 - 135,000 lb. MGTOW
- Boeing 737-700
 - Stage 4
 - 155,000 lb. MGTOW
- Boeing 757-200
 - Stage 4
 - 250,000 lb. MGTOW

Note: Representative maximum gross takeoff weights (MGTOW).



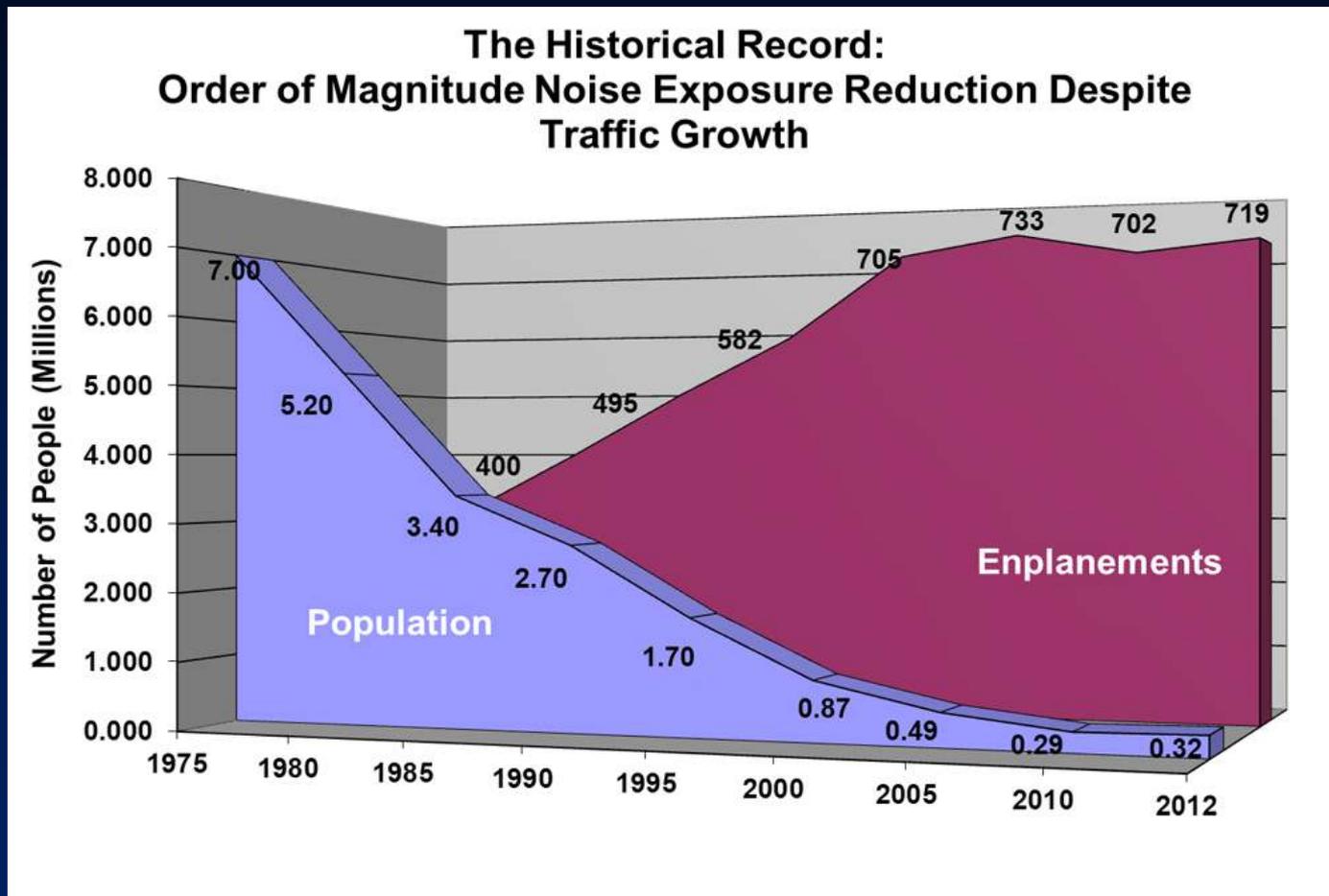
Aviation Safety and Noise Abatement Act and Part 150

- Aviation Safety and Noise Abatement Act of 1979 (ASNA)
 - Requires FAA to establish a single system of measuring noise
 - Required FAA to issue regulations on "noise compatibility planning"
- FAA promulgated Part 150
 - Selected the A-weighted sound level (dBA)
 - Selected the Day-Night-Average Sound Level (DNL)
 - Defined a *voluntary* noise compatibility planning process

Part 150: Identifying Compatible Land Uses

- Identifies variety of land use categories considered to be compatible with aircraft operations for a range of noise levels
 - Suggests 65 dB DNL threshold of compatibility for residential uses
 - See *generally*: Table at 14 CFR Part 150, Appendix A.
- **NOTE!** This guidance may change
 - Was based in part on economic and technological feasibility
 - Aircraft source levels have been reduced significantly
 - Part 150 programs have mitigated most other impacts
 - So, lower threshold may be technologically and economically feasible
 - FAA is sponsoring research into relationship of noise to annoyance and sleep disturbance which may provide scientific justification for lowering compatibility criterion below 65 DNL
 - Legislation proposed in Congress to require FAA to change guidance

Population within 65 DNL has declined sharply, despite increasing numbers of airline passengers



Part 150: Noise Compatibility Planning

- Establishes a voluntary process for airport noise studies
 - Participation provides access to FAA funding of some approved measures
 - ASNA Sec. 107
 - “Protects” airports against damage claims for properties purchased after NEM has been submitted
 - Never tested in court
- Limited consultation requirements
 - But extensive “voluntary” stakeholder outreach is the norm

Part 150: Noise Compatibility Planning

- **Noise Exposure Map (NEM)**
 - Detailed description of airport layout, operations, noise, land uses, and noise/land use compatibility
 - FAA “accepts” the NEM
 - Prepared according to accepted methodology?
- **Noise Compatibility Program (NCP)**
 - Noise abatement measures to reduce noise exposure
 - Land use measures to address non-compatible uses
 - Program management/implementation measures
 - FAA “approves” the NCP
 - Any undue burden on interstate commerce?
 - Reduces existing noncompatible land uses?
 - Prevents future incompatible uses?

Airport Noise and Capacity Act of 1990, ANCA

- Required FAA to complete phase-out of Stage 2 aircraft over 75,000 pounds by 12/31/99
 - FAA promulgated Part 91 amendment (1991)
- Required FAA to establish regulations regarding analysis, notice, and approval of airport noise and access restrictions
 - FAA implemented through FAR Part 161 (1991)
 - Grandfathered existing use restrictions

Part 161:

Airport Noise and Access Restrictions

- Establishes federal program for reviewing noise and access restrictions on use of Stage 2 and 3 aircraft
 - Stage 2 restrictions are moot as of January 1, 2016
- Comprehensive analysis required, e.g.:
 - Evidence of noise problem
 - Impacts analysis
 - Benefit-cost analysis
- Encourages voluntary agreements

Part 161:

Airport Noise and Access Restrictions

- Statutory conditions for approval of an access restriction
 - Reasonable, nonarbitrary and nondiscriminatory
 - No undue burden on interstate or foreign commerce
 - Maintains safe and efficient use of navigable airspace
 - No conflict with existing Federal law
 - Adequate opportunity for public comment
 - No undue burden on national aviation system

Part 161:

Airport Noise and Access Restrictions

- Many potential roadblocks
 - No guidance for benefit/cost analysis
 - Aviation interests - a key data source, unlikely to assist
 - FAA has made its opposition clear
- Study of last resort - perhaps a dozen airports have pursued
 - Some abandoned, some disapproved by FAA, some resulted in voluntary agreements
 - Since 1991, FAA has approved only two new restrictions
 - Naples Stage 2 ban and Van Nuys Stage 2 phaseout
 - All other formal use restrictions in place in the U.S. were “grandfathered” under ANCA and Part 161.

In Summary:

- Part 36 sets aircraft noise limits
- Part 91 sets phase-out schedules
- Part 150 guides compatibility planning
 - Most easily attained benefit has been achieved at most airports
- Part 161 regulates use restrictions
 - Strong FAA opposition to application

Questions?

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