

2020 UC Davis

Aviation Noise & Emissions Symposium

# Regulating Aviation Noise

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## Presentation Outline

- Introduction
- Airport Noise – Roles and Responsibilities
- Regulatory Framework
- Federal Aviation Noise Regulations
- Recent Aviation Noise-Related Legislation
- Summary

## Introduction

- Aircraft/Airport noise regulations and policies are not static
- Careful balance between federal and local authority
- FAA sets many rules and controls funding
- Local governments have an important role to play through the regulation of land use

## Roles and Responsibilities

- Roles and Responsibilities – Airport Noise Control\*
  - Federal Aviation Administration
  - Airport Proprietor
  - Local Governments
  - Aircraft Operators
  - Others

\*DOT/FAA Aviation Noise Abatement Policy, November 18, 1976

## Roles and Responsibilities

### Federal Aviation Administration

- Sets noise level requirements for aircraft
- Provides funding for, and approval of, noise compatibility planning (when appropriate and/or when funds are available)
- Manages the air traffic control and airspace system

## Roles and Responsibilities

### Federal Aviation Administration

- Exclusive authority to certify aircraft and pilots
- Exclusive authority to control aircraft in the air and on runways/taxiways\*

\*Control of aircraft in flight is shared with the pilot-in-command

## Roles and Responsibilities

### Airport Proprietors

- Plan and implement actions designed to reduce the adverse effects of noise on residents of the surrounding area including:
  - Improvements in airport design
  - Noise abatement ground procedures
  - Land acquisition
  - Restrictions on airport use (reasonable, nonarbitrary and not unjustly discriminatory restrictions)

## Roles and Responsibilities

### Local Governments

- Can
  - Promote compatible land use through zoning
  - Prohibit incompatible land uses
  - Require real estate disclosure
  - Include current noise data in municipal code
- Cannot
  - Directly restrict aircraft operations or regulate “routes, rates or service” of air carriers
  - Tax airport passengers



## Roles and Responsibilities

### Aircraft Operators

- Fly quieter aircraft
- Fly responsibly
  - Safety first and foremost
  - Use industry recommended noise abatement procedures
  - Use preferred noise abatement runways
  - Follow airport's published noise abatement procedures
  - Follow noise abatement flight tracks

## Roles and Responsibilities

### Others

- Pilot in command has sole responsibility for the safe operation of his or her aircraft
- Aviation system users pay for the entire aviation system including the adverse impacts of noise
- Users finance the cost of noise-reducing measures such as:
  - New quieter aircraft
  - Research and development into noise reducing technologies
  - Planning and land use compatibility studies
  - Land acquisition, sound insulation, ground run-up enclosures

## Roles and Responsibilities

### Others

- Prospective residents should become informed about aircraft noise impacts and should act accordingly

## Regulatory Framework

- Federal law sets aircraft noise standards, prescribes operating rules, establishes the compatibility planning process, and limits airport proprietor's ability to restrict aircraft operations
- State laws establish compatibility planning guidelines and noise standards, but aircraft in flight are exempt

## Regulatory Framework

- Local noise ordinances set local noise standards and provide for compatible land use planning, but aircraft in flight are exempt

**FEDERAL LAW PREEMPTS STATE AND LOCAL REGULATIONS**

## Federal Aviation Noise Regulations

- 14 CFR Part 36 and 14 CFR Part 91
- U.S. Department of Transportation Aviation Noise Abatement Policy
- Aviation Safety and Noise Abatement Act of 1979
- 14 CFR Part 150
- Airport Noise and Capacity Act of 1990 and 14 CFR Part 161
- FAA Orders 5050.4B and 1050.1F
- FAA Order 5100.38D and FAR Part 158

## 14 CFR Part 36 – Noise Standards: Aircraft Type and Airworthiness Certification

- Adopted in 1969 in response to the Federal Aviation Act enacted by Congress in 1968
- Prescribes noise standards for issuance of new aircraft type certifications
- Amended in 1973 in response to the Noise Control Act of 1972
- Amended again in 1977 and 2003
- In November 2017, FAA issued Stage 5 regulations mirroring the ICAO Chapter 14 Standards with two effective dates for small (2020) and large aircraft (2017)
  - The dividing line between large and small is 121,254 pounds

## 14 CFR Part 36 – Noise Standards: Aircraft Type and Airworthiness Certification

- Aircraft may be certified as Stage 2, Stage 3, Stage 4 or Stage 5 based on their noise level, weight, number of engines, and in some cases – number of passengers
- Stage 1\* and Stage 2 are no longer permitted to operate in the United States
- FAA has indicated it does not intend to propose a phase out of Stage 3 aircraft in the foreseeable future

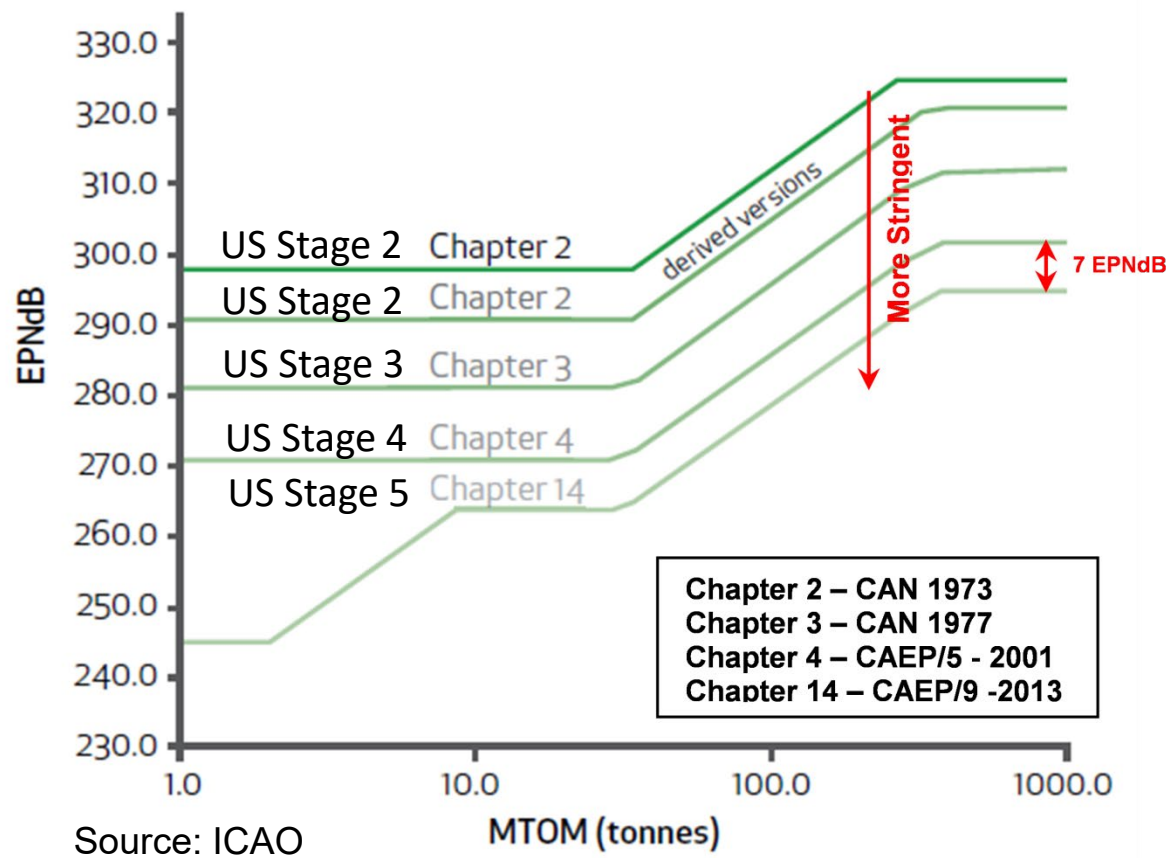
\*Aircraft that predated the Part 36 noise standards are referred to as Stage 1 aircraft



## International Civil Aviation Organization (ICAO)

- Committee on Aviation Environmental Protection (CAEP) promoted more stringent noise certification standards
- CAEP agreed on and forwarded to the full ICAO assembly new Chapter 14 noise levels
- The new levels went into effect for newly manufactured large aircraft on January 1, 2018
- The new standard is 7 EPNdB below the Stage 4 standard

## International Civil Aviation Organization (ICAO)



Source: ICAO

## 14 CFR Part 91 – General Operating and Flight Rules

- Addresses the operation of aircraft in flight
- Establishes airspace classifications
- Establishes operating conditions (IFR, VFR, etc.)
- Addresses the operation of supersonic aircraft within the United States
- Amended in 1990 to address the phase-out of large Stage 2 aircraft

## U.S. Department of Transportation Aviation Noise Abatement Policy (1976)

- Set forth noise abatement authorities and responsibilities of the federal government, airport proprietors, state and local governments, air carriers, air travelers and shippers, and airport area residents and prospective residents
- FAA's primary role is regulating noise at its source (the aircraft), plus supporting local efforts to develop noise abatement plans
- Role of state and local governments, along with airport proprietors, to undertake land use and operational actions to promote compatibility

## Aviation Safety and Noise Abatement Act of 1979

- Further strengthened FAA's supporting role in noise compatibility planning
- Stated purpose "To provide assistance to airport operators to prepare and carry out noise compatibility programs."
- Established funding for noise compatibility planning
- Sets requirements by which airport operators can apply for funding
- Does not require any airport to develop a noise compatibility program

## 14 CFR Part 150 – Airport Noise Compatibility Planning

- Adopted FAA regulations for implementing the Aviation Safety and Noise Abatement Act of 1979
- Published noise and land use compatibility charts to be used for land use planning with respect to aircraft noise
- Residential land use deemed acceptable for noise exposure up to 65 dB DNL
- Allows airport sponsors to access federal funds for noise mitigation programs

## Airport Noise and Capacity Act of 1990 (ANCA)

- Established a method to review aircraft noise, airport use, or access restrictions imposed by airport proprietors
- Instituted a program to phase-out Stage 2 aircraft over 75,000 lbs. by December 31, 1999
- No phase-out of Stage 2 aircraft under 75,000 lbs.
  - The FAA Modernization and Reform Act of 2012 instituted a phase-out of Stage 1 and Stage 2 aircraft under 75,000 lbs. by January 1, 2017

## Airport Noise and Capacity Act of 1990 (ANCA)

- Applies to all local noise restrictions that were proposed after October 1990
- Grandfathered all aircraft noise and access restrictions that existed prior to November 1990
- Established a process for proposed aircraft noise and access restrictions (14 CFR Part 161)



## 14 CFR Part 161 – Notice and Approval of Airport Noise and Access Restrictions

- Defines the requirements for enacting noise and access restrictions on Stage 2 and Stage 3 aircraft greater than 75,000 lbs.
- Severely limits an airport proprietor's ability to enact restrictions on aircraft operations
- Encourages voluntary agreements to control aircraft noise
- Airport proprietor imposed restrictions must be considered a last resort when all other efforts have failed to eliminate the incompatible land uses

## 14 CFR Part 161 – Notice and Approval of Airport Noise and Access Restrictions

- Identifies three types of restrictions
  - Negotiated restrictions
  - Stage 2 aircraft restrictions
  - Stage 3 aircraft restrictions
- Each type of restriction is treated differently
- Even though the ANCA phase-out did not apply to aircraft under 75,000 lbs., the FAA has determined that 14 CFR Part 161 applies to smaller aircraft with regard to proprietors' restrictions authority

## FAA Orders 5050.4B and 1050.1F

- Guidelines developed by the FAA pertaining to environmental analysis under the National Environmental Policy Act (NEPA)
- FAA Order 1050.1F provides overall NEPA guidance for all FAA divisions
- FAA Order 5050.4B provides guidance to the Airports Division of the FAA which oversees the review of airport development projects
- The FAA's 1050.1F Desk Reference provides additional information regarding compliance with NEPA and special purpose laws

## FAA Orders 5050.4B and 1050.1F

- FAA considers only those noise impacts that occur at 65 dB DNL/CNEL or greater
- Increases in noise levels for noise sensitive areas over 1.5 dB DNL/CNEL, within the 65 dB DNL/CNEL contour, are considered “significant”
- If an action causes a significant impact over noise sensitive areas, additional analysis should be conducted between 60 dB DNL/CNEL and 65 dB DNL/CNEL to determine if an increase of 3 dB DNL/CNEL occurs
- A 3-dB increase is not considered “significant”, but must be disclosed for informational purposes

## FAA Orders 5050.4B and 1050.1F

- Areas where quiet is an expected characteristic of the setting such as such as national parks, wildlife refuges, and cultural/historical sites may require special consideration below 65 dB DNL
- The FAA official responsible for the project decides which supplemental metrics, if any, should be used in noise impact analysis
- Airport proprietors/communities should work with the FAA to identify those metrics

## FAA Order 5100.38D – AIP Handbook

- Provides guidance and requirements for FAA funding of noise-related projects:
  - Noise and land use planning studies, sound insulation, noise barriers, ground run-up enclosures, mitigation measures, noise monitoring systems, land acquisition
- Defines solicitation and selection process
- Identifies performance standards for project funding
- Incorporates the guidance in Program Guidance Letter 12-09

## Federal Aviation Administration Program Guidance Letter (PGL) 12-09

- Clarified guidance on sound insulation program funding
- Requires a dwelling unit be within the 65 dB DNL/CNEL contour and have an interior noise level greater than 45 DNL/CNEL
- Eliminated homes assumed to be previously eligible
- This clarification is incorporated into FAA Order 5100.38D

## 14 CFR Part 158 – Passenger Facility Charges

- Implements the provisions of ANCA related to the creation of a passenger facility charge (PFC)
- Reducing noise or mitigating noise is eligible for PFC funding at a level of \$1, \$2, or \$3 per Section 158.15 of FAR Part 158
- An application has to be approved for the amount of the PFC, but unlike AIP grants, airport proprietors may use PFC funds for noise mitigation without an FAA-approved 14 CFR Part 150 Noise Compatibility Program, as long as the airport's noise exposure maps have been prepared under the procedures specified in 14 CFR Part 150



## Airport Cooperative Research Program (ACRP)

- Funded by the FAA and administered by the National Academy of Sciences
- Research on a variety of aviation issues including aircraft noise
  - Improvements in aircraft noise modeling
  - Helicopter noise research
  - Sound insulation programs
  - Public outreach

## Recent Aviation Noise-Related Legislation

- The FAA Reauthorization Act of 2018, which was signed on October 5, 2018, contains 13 aviation noise-related provisions
- Subtitle D, Airport Noise and Environmental Streamlining, of the Act contains the following noise provisions:

## Recent Aviation Noise-Related Legislation

- Section 172. Authorization of certain flights by Stage 2 aircraft.
  - Establishes a pilot program for the operation of Stage 2 aircraft between not more than 4 medium hub or nonhub airports, with specific characteristics.
- Section 173. Alternative airplane noise metric evaluation deadline.
  - Requires that the FAA complete an evaluation of alternative metrics to the current Day Night Average Sound Level (DNL) 65 standard within one year of the date of enactment.

## Recent Aviation Noise-Related Legislation

- Section 174. Updating airport noise exposure maps.
  - Builds on the current requirement that a noise exposure map – for those airports that have one – must be updated when there is a change in the surrounding area, such as a significant new noncompatible use, or a change in the operation of the airport would significantly reduce noise over existing noncompatible uses. Additional language has been added clarifying that if one of the listed changes occurs, an updated noise exposure map is only required if the change either comes into effect during the forecast period of the existing noise exposure map, or during the implementation period of the airport operator's noise compatibility program.

## Recent Aviation Noise-Related Legislation

- Section 175. Addressing community noise concerns.
  - Requires the FAA to consider the feasibility of implementing dispersal headings for new RNAV departure procedures below 6,000 AGL if: (1) the airport requests it, (2) it would not have safety or efficiency implications, and (3) it would not significantly increase noise over other noise-sensitive areas.
- Section 176. Community involvement in FAA NextGen projects located in metroplexes.
  - Requires the FAA to prepare a review (within 180 days) of FAA's community involvement practices for NextGen projects located in Metroplexes. That review is to be followed by a report (within 60 days) containing: (1) recommendations for improving community involvement for NextGen projects in Metroplexes; (2) discussion of how and when the FAA will engage airports and communities in PBN proposals, and (3) lessons learned from NextGen projects.

## Recent Aviation Noise-Related Legislation

- Section 179. Airport noise mitigation and safety study.
  - Requires the FAA to conduct a study to review and evaluate existing studies and analyses of the relationship between jet aircraft approach and takeoff speeds and corresponding noise impacts on communities surrounding airports. It would also look at whether reduced approach or takeoff speeds would jeopardize aviation safety and/or: cause the National Airspace System (NAS) to operate less efficiently; impact capacity; and increase fuel burn.
- Section 180. Regional ombudsmen.
  - Requires the FAA to designate a Regional Ombudsman for each region who would serve as a liaison with the public to address “issues regarding aircraft noise, pollution, and safety” and make recommendations to the Regional Administrators to address concerns raised by the public.

## Recent Aviation Noise-Related Legislation

- Section 181. FAA leadership on civil supersonic aircraft.
  - Directs the FAA Administrator to exercise leadership in the creation of Federal and international policies, regulations, and standards relating to the certification and safe and efficient operation of civil supersonic aircraft. It directs the FAA to obtain aerospace industry stakeholders input regarding regulatory framework, and issues related to standards and regulations for the type certification and safe operation of civil supersonic aircraft, including noise certification. This provision also directs FAA to exercise international leadership. FAA is required to issue a notice of proposed rulemaking by March 31, 2020, for civil supersonic noise standards.

## Recent Aviation Noise-Related Legislation

- Section 186. Stage 3 aircraft study.
  - Directs GAO to undertake a review of the potential benefits, costs, and other impacts that would result from a phase out of covered Stage 3 aircraft. The review must include:
    - Inventory of covered Stage 3 aircraft
    - Benefits, costs, and impacts to a variety of stakeholders, including air carriers, GA operators, airports, communities surrounding airports, and the general public
    - Lessons learned from the phase out of Stage 2 aircraft
    - Costs and logistical challenges associated with recertifying Stage 3 aircraft capable of meeting Stage 4 noise levels
    - Stakeholder views on the feasibility and desirability of phasing out covered Stage 3



## Recent Aviation Noise-Related Legislation

- Section 187. Aircraft noise exposure.
  - Requires the FAA to conduct a review of the impact of noise exposure on communities around airports. The FAA would be required to submit a report to Congress on their findings within 2 years, including FAA's recommendations for revisions to their land use compatibility guidelines in Part 150 of Title 14 CFR.
- Section 188. Study regarding day-night average sound levels.
  - Directs the FAA to evaluate alternative metrics to the current average day-night level standard. (Note, this is similar to Section 173, except that it adds the requirement of consideration of actual noise sampling and other methods, and an accelerated schedule.)

## Recent Aviation Noise-Related Legislation

- Section 189. Study on potential health and economic impacts of overflight noise.
  - Requires the FAA to engage a university to conduct a health study in a number of metropolitan areas (Boston, Chicago, the District of Columbia, New York, the Northern California Metroplex, Phoenix, the Southern California Metroplex, Seattle, or such other area as may be identified by the FAA), focusing on “incremental health impacts on residents living partly or wholly underneath flight paths most frequently used by aircraft flying at an altitude lower than 10,000 feet, including during takeoff or landing”; and “an assessment of the relationship between a perceived increase in aircraft noise, including as a result of a change in flight paths that increases the visibility of aircraft from a certain location, and an actual increase in aircraft noise, particularly in areas with high or variable levels of non-aircraft-related ambient noise.”

## Recent Aviation Noise-Related Legislation

- Section 190. Environmental mitigation pilot program.
  - Provides for FAA grants of up to \$2.5 million to six airports to carry out pilot environmental mitigation programs that would “measurably reduce or mitigate aviation impacts on noise, air quality, or water quality at the airport or within 5 miles of the airport.” The federal share of this project would be up to 50%, and projects must be carried out by a consortium of entities that includes two or more of the following: businesses, educational or research organizations, state or local governments, and/or federal laboratories.

## Numerous Aviation Noise-Related Bills are Currently Pending

- Including eight bills introduced by Congresswoman Jackie Speier (D-CA) in December 2019:
  - H.R. 5105 - Responsive Employees Support Productive Educated Congressional Talk (RESPECT) Act (*Would Compel FAA to Respond to Congressional Inquiries and Direction*)
  - H.R. 5106 - Restore Everyone's Sleep Tonight (REST) Act (*Would Allow Airport Operator Imposed Nighttime Curfews*)
  - H.R. 5107 - Serious Noise Reduction Efforts (SNORE) Act (SFO Focused)
  - H.R. 5108 - Southbound HUSSH and NIITE Help Households (SHHH) Act (SFO and OAK Focused)

## Numerous Aviation Noise-Related Bills are Currently Pending

- Including eight bills introduced by Congresswoman Jackie Speier (D-CA) in December 2019 (cont.):
  - H.R. 5109 - Fairness in Airspace Includes Residents (FAIR) Act (*Makes Noise and Health FAA's Second Priority After Safety*)
  - H.R. 5110 - All Participating in Process Reaching Informed Solutions for Everyone (APPRISE) Act (*Promotes Community Input into FAA Airspace Decisions*)
  - H.R. 5111 - Notify Officials to Inform Fully and Impel Educated Decisions (NOTIFIED) Act (*Informs Local Governments, Members of Congress, and Roundtables of Flight Track Changes*)
  - H.R. 5112 - Low-frequency Energetic Acoustics and Vibrations Exasperate (LEAVE) Act (*Addresses Ground Based Noise*)

## Numerous Aviation Noise-Related Bills are Currently Pending

- Also in December 2019, Representative Joseph Neguse (D-CO) introduced the Aircraft Noise Reduction Act (H.R. 5423), which would give airport proprietors the ability to restrict aircraft operations
  - This bill is strongly opposed by aircraft trade organizations
- While these bills may make it out of the House, they are not likely to make it through the Republican-controlled Senate unless attached to some larger, bipartisan bill

## What to Watch for in the Coming Years

- Noise regulations related to drones
- New noise standards for supersonic aircraft

## Summary

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*Questions?*