

LAX Airport/Community
Noise Roundtable

Aircraft Noise 101:
Part 2

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solutions and
service meet.

Part 2 of a Two-Part Noise 101 Presentation

- Part 1 was given at the July 10, 2019 LAX/Community Noise Roundtable Meeting
 - The presentation is available at <https://www.lawa.org/en/lawa-environment/noise-management/lawa-noise-management-lax/community-noise-roundtable>
- Part 1 focused on noise metrics, federal and state aircraft noise standards, and principles of aircraft noise control
- Part 2 focuses on quantifying aircraft noise exposure and relevant regulations

Acoustic Principles

- Noise is unwanted sound
 - By its very nature noise is subjective
 - What is music to my ears may be noise to you
 - We measure or model sound levels and relate them to social surveys to assess the potential for annoyance

Quantifying Aviation Noise Exposure

- Measuring sound levels will accurately tell us:
 - The sound levels at a specific location for the time period the measurements were made
 - The historical record of the sound levels at a specific location
 - Historical trends; but measurements do not predict future noise levels

Quantifying Aviation Noise Exposure

- Modeling sound exposure can:
 - Accurately tell us the sound levels over broad geographic areas as well as at specific locations for a specific time period
 - Produce a historical record
 - Be predictive by showing expected trends in aircraft noise exposure
 - Be used to prepare “What If?” scenarios

Noise Measurement Standards

- 14 CFR Part 150 establishes the noise measurement methods and metrics for conducting aircraft noise measurements for federal noise studies
- Title 21 of the State Aeronautic Act sets the noise standards for quantifying aircraft noise in California
- Local municipalities often specify noise measurement standards in noise ordinances or general plans

Aircraft in flight are exempt from local noise ordinances

Aircraft Noise Modeling Concepts

- Mathematical models are used everyday to depict a variety of real-life situations such as:
 - Weather prediction, bridge loading, aerodynamic performance, fuel economy, and computer animation
- Model accuracy is a function of the modeling algorithms, the empirical databases, and user sophistication
- When used properly, aircraft noise models have proven to be highly accurate

Aviation Environmental Design Tool

- The Aviation Environmental Design Tool (AEDT) Version 3b is current the FAA-approved model for use in preparing:
 - Noise analyses for noise elements of airport master plans
 - Noise exposure maps for 14 CFR Part 150 and 14 CFR Part 161 studies
 - Noise and air emissions analyses for federal environmental assessments and environmental impact statements
 - Noise analyses for state environmental impact reports

Aviation Environmental Design Tool

- AEDT is based on the Integrated Noise Model (INM), which had been in use for over 35 years and was continually updated to improve its accuracy
- AEDT combines the capabilities of the Emissions Dispersion Modeling System (EDMS) and INM in a single model
- AEDT allows for assessing the trade offs between air emissions and noise impacts

Aircraft Noise Model Application

- FAA Orders 1050.1F and 5050.4B require the use of noise models for the quantification of aircraft noise impacts in environmental assessments (EAs) and environmental impact statements (EISs)
- Noise measurements may be made for 14 CFR Part 150 studies, EAs, and EISs to provide supplemental information, but they may not be used to “calibrate” the noise models

Aircraft Noise Regulations

- Aircraft/Airport noise regulations and policies are not static
- 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

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
- California state law establishes compatible land use planning guidelines and airport noise standards, but aircraft in flight are exempt

Regulatory Framework

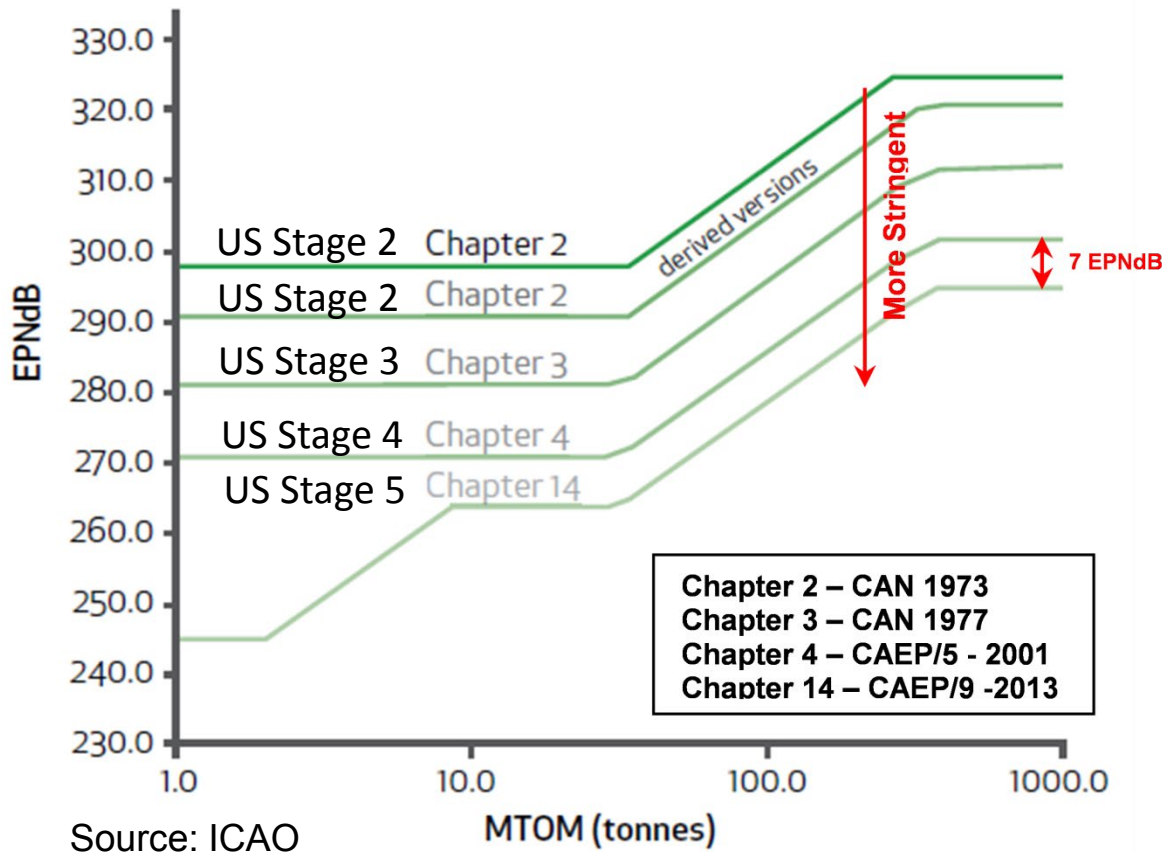
- Local noise ordinances set local noise standards and provide for compatible land use planning, but aircraft in flight are exempt

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 1050.1F and 5050.4B
- Recent Aviation-Related Legislation

14 CFR Part 36 and ICAO Noise Limits



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)

- Sets 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 proprietor 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 is deemed acceptable for noise exposure up to 65 dB DNL/CNEL
- 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)
- Only one successful Part 161 Study since 1991

FAA Orders 1050.1F and 5050.4B

- 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
- The FAA's 1050.1F Desk Reference provides additional information regarding compliance with NEPA and special purpose laws
- FAA Order 5050.4B provides guidance to the Airports Division of the FAA which oversees the review of airport development projects

FAA Orders 1050.1F and 5050.4B

- 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 1050.1F and 5050.4B

- Areas where quiet is an expected characteristic of the setting such as national parks, wildlife refuges, and cultural/historical sites may require special consideration below 65 dB DNL/CNEL
- 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

Recent Aviation-Related Legislation

- The 2018 FAA Reauthorization Act included a number of noise-related provisions
- These provisions were covered in detail at the November 14, 2018 LAX/Airport Community Roundtable meeting
- Provisions to monitor include: FAA's development of new aircraft noise standards for supersonic aircraft, the ability to request flight track dispersion be included in new or amended departure procedures, and the release of the national aircraft noise annoyance survey results

Questions?