Educational Series: Aircraft Noise Mitigation

July 17, 2024

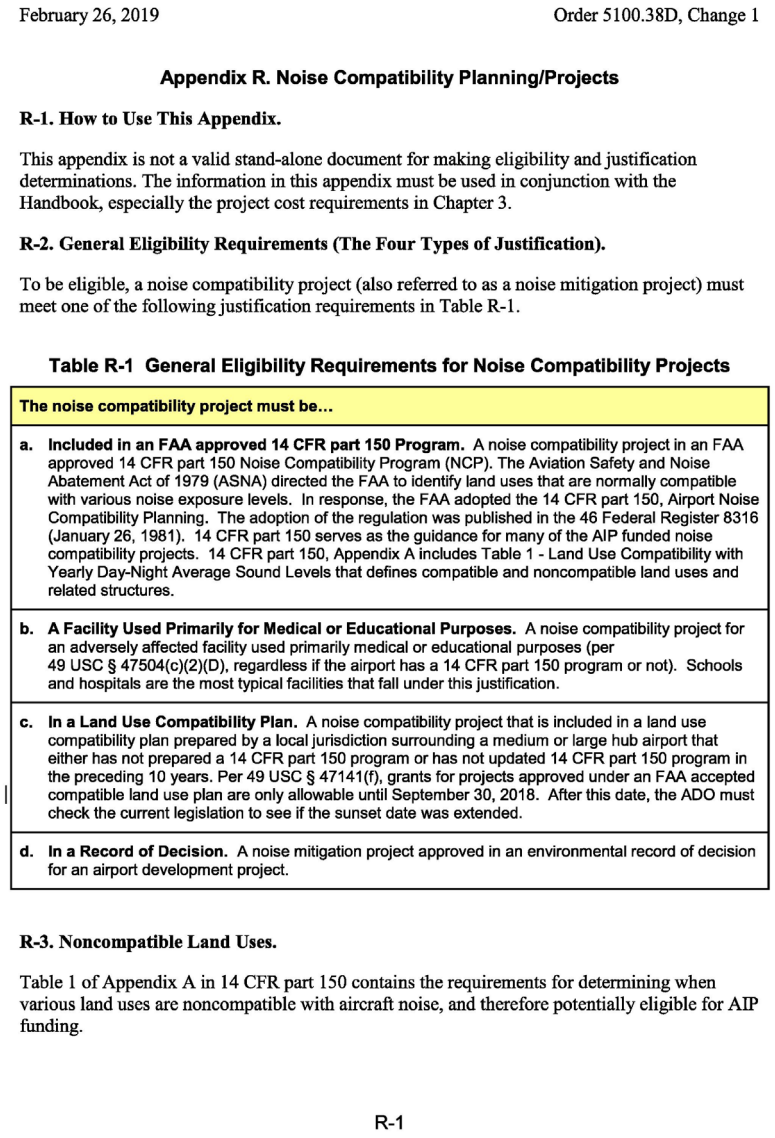
Noise Mitigation

- Understanding the range of aircraft noise mitigation strategies
  - Noise Compatibility Program (Part 150) elements
  - Sound insulation programs

Noise Mitigation Measures

Airport Improvement Program (AIP) Handbook (FAA Order 5100.38D) Appendix R:

- Land Acquisition
- Noise Easement Purchase
- Sound Insulation
- Barriers



February 26, 2019 Order 5100.38D, Change 1

Appendix R. Noise Compatibility Planning/Projects

R-1. How to Use This Appendix.

This appendix is not a valid stand-alone document for making eligibility and justification determinations. The information in this appendix must be used in conjunction with the Handbook, especially the project cost requirements in Chapter 3.

R-2. General Eligibility Requirements (The Four Types of Justification).

To be eligible, a noise compatibility project (also referred to as a noise mitigation project) must meet one of the following justification requirements in Table R-1.

Table R-1 General Eligibility Requirements for Noise Compatibility Projects

The noise compatibility project must be...
a. **Included in an FAA approved 14 CFR part 150 Program.** A noise compatibility project in an FAA approved 14 CFR part 150 Noise Compatibility Program (NCP). The Aviation Safety and Noise Abatement Act of 1979 (ASNA) directed the FAA to identify land uses that are normally compatible with various noise exposure levels. In response, the FAA adopted the 14 CFR part 150, Airport Noise Compatibility Planning. The adoption of the regulation was published in the 46 Federal Register 8316 (January 26, 1981). 14 CFR part 150 serves as the guidance for many of the AIP funded noise compatibility projects. 14 CFR part 150, Appendix A includes Table 1 - Land Use Compatibility with Yearly Day-Night Average Sound Levels that defines compatible and noncompatible land uses and related structures.
b. **A Facility Used Primarily for Medical or Educational Purposes.** A noise compatibility project for an adversely affected facility used primarily medical or educational purposes (per 49 USC § 47504(c)(2)(D), regardless if the airport has a 14 CFR part 150 program or not). Schools and hospitals are the most typical facilities that fall under this justification.
c. **In a Land Use Compatibility Plan.** A noise compatibility project that is included in a land use compatibility plan prepared by a local jurisdiction surrounding a medium or large hub airport that either has not prepared a 14 CFR part 150 program or has not updated 14 CFR part 150 program in the preceding 10 years. Per 49 USC § 47141(f), grants for projects approved under an FAA accepted compatible land use plan are only allowable until September 30, 2018. After this date, the ADO must check the current legislation to see if the sunset date was extended.
d. **In a Record of Decision.** A noise mitigation project approved in an environmental record of decision for an airport development project.

R-3. Noncompatible Land Uses.

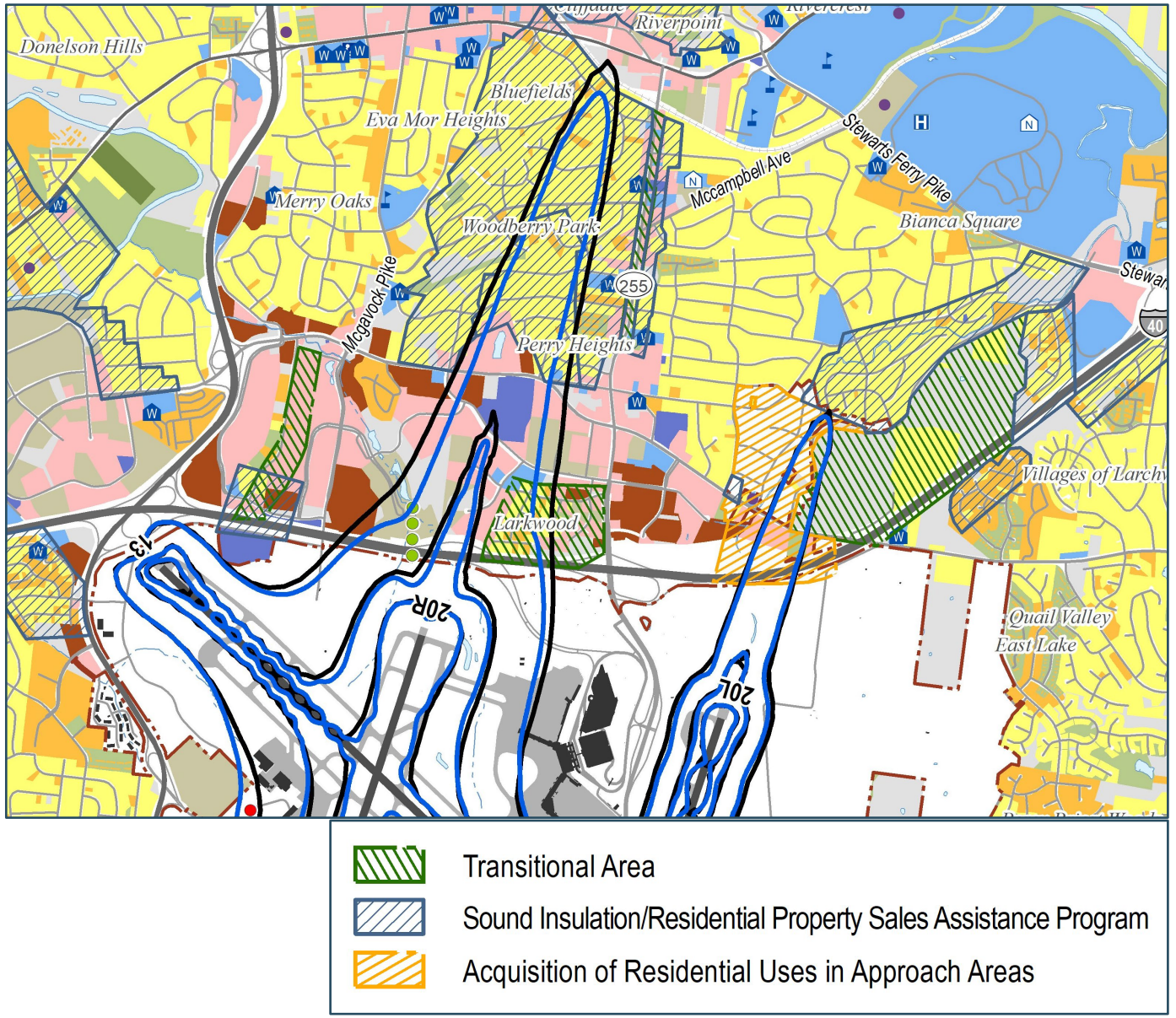
Table 1 of Appendix A in 14 CFR part 150 contains the requirements for determining when various land uses are noncompatible with aircraft noise, and therefore potentially eligible for AIP funding.

R-1

Land Acquisition

Purpose: Change land use for noise compatibility

- Purchase property at fair market value
- Change to compatible use
- Return FAA grant funds once acquired land is no longer needed for noise purposes



Noise Easement Purchase

Purpose: Deed of property to disclose aircraft noise to future buyers

- Determine fair market price of noise easement
- Obtain FAA approval of recommended price
- Sign agreement with property owner
- Provide check to property owner once the noise easement is registered with the deed as indicated by the local jurisdiction

Noise Barriers

Purpose: Reduce noise in nearby communities from ground noise sources, e.g. taxi, engine run-ups, by at least 5 dB

Examples (must be on airport property):

- Noise barriers
- Earth berms
- Wall structures
- Ground engine run-up enclosures (GRE)

Sound Insulation

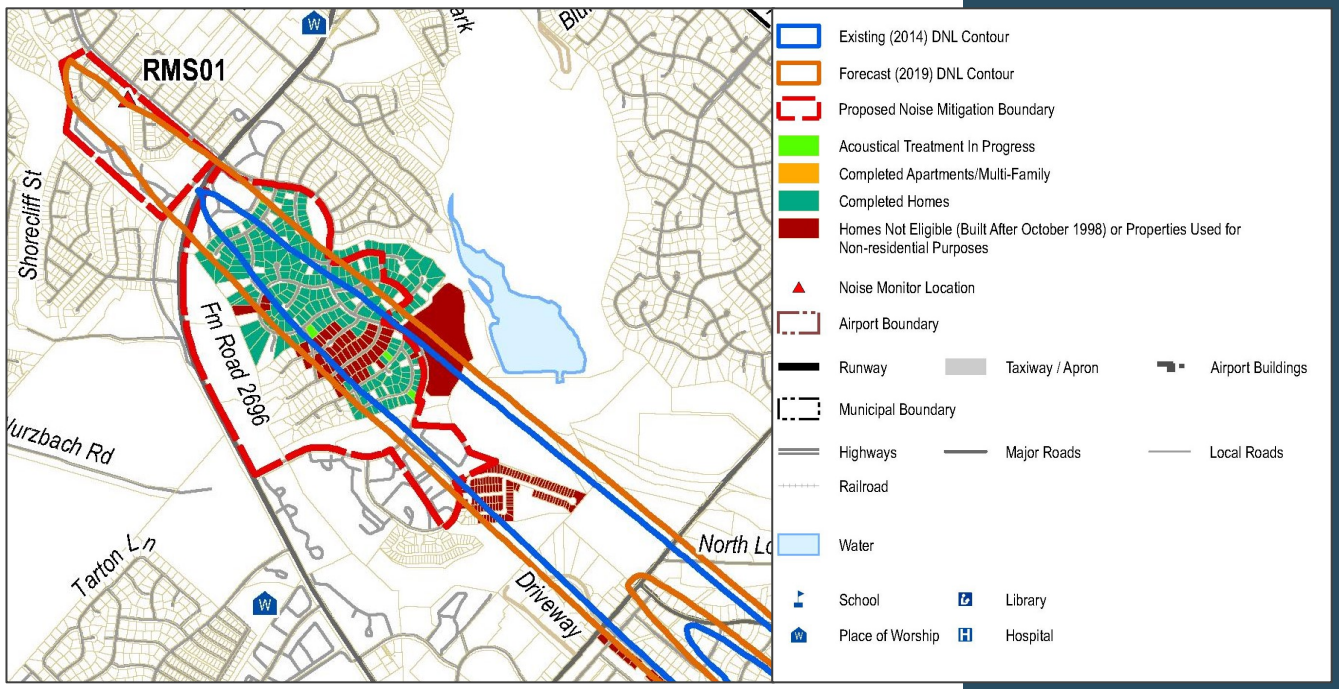
Purposes:

- Preserve neighborhoods & communities
- Improve homes & neighborhoods
- Make interior of homes more habitable
- Generate good will
- Improve community support (good public relations tool)

"to reduce the adverse impact of airport-related noise on building occupants or residents"

Program Eligibility

- Program must be included in an FAA approved Noise Compatibility Program measure
- Parcel must be within the 65 DNL noise exposure contour of FAA-accepted NEM
  - Block rounding may be used to extend the eligibility area to the next logical break point



Program Eligibility *(continued)*

For sound insulation programs:

- A noise-sensitive structure must be experiencing average interior noise levels that are 45 dB or greater with windows closed
  - Residences in terms of DNL
  - Schools in terms of a noise metric for hours of the school day (such as L_{eq})
  - Other room types in terms of a noise metric for hours of use
- If average interior noise levels are less than 45 dB, positive ventilation may be offered to ensure occupants are able to maintain a windows closed environment.

FAA Guidance – Sound Insulation Goals

Residential Structures:

- Achieve interior DNL $\leq$ 45 dB
- Achieve at least 5-dB improvement in Noise Level Reduction

School Sound Insulation Programs:

- Achieve interior $L_{eq} \leq$ 45 dB (A-weighted)
  - L_{eq} over the hours of use, e.g., $L_{eq,7}$
- Achieve at least 5-dB improvement in Noise Level Reduction

Example:

- Residence located in an area exposed to DNL 73 dB
- Existing NLR of 26 dB (measured during pre-test)
- However, requisite NLR is 28 dB (= 73 - 45)
- Must provide a minimum 5 dB improvement

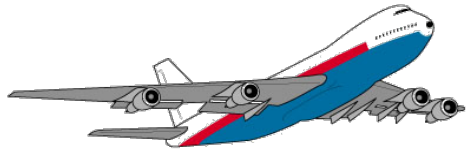
For this residence, the proposed sound insulation treatment(s) should result in an NLR of 31 dB (= 26 + 5)

Sound Insulation Treatment Protocols

FAA currently allows the following treatments:

- Window and door replacement
- Caulking
- Weather stripping
- Central air ventilation

"The use of other measures is not allowable unless the ADO has approved the use of the measure in advance."



Pictorial Representation of Sound Transmission through Built Construction

Sound Transmission Class (STC)

- Single number rating for sound insulating performance
- Developed for subjective impressions of sound transmission of speech, radio, television, and similar noise sources through interior partitions in buildings
- Best indication available to determine the performance of a product prior to installation and testing in situ
- OITC (Outdoor Indoor Transmission Class) is beginning to be used more for airport sound insulation programs

Questions/Discussion

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