

GLOSSARY

The noise study may use terms and abbreviations in its reports that may be unfamiliar to the public. We are providing this glossary as a reference of commonly used terms in a 14 CFR Part 150 Study.

A-weighted Sound Level (dBA): A measurement of loudness which accounts for the frequency sensitivity of the human ear. The “A” weighting accounts for frequency dependence by adjusting the very high and very low frequencies (below approximately 500 Hz and above approximately 10,000 Hz) to approximate the human ear’s lower sensitivities to those frequencies. Sound in each one third octave band is weighted and summed.

Acoustics: The study of the generation, propagation and reception of sound.

Advisory Circular (AC): A Federal Aviation Administration issued document providing methods, procedures, and practices for compliance with regulations and grant requirements.

Air Traffic Control (ATC): The function of providing positive control and aircraft separation services to participating aircraft through safe, orderly, and expeditious traffic flow procedures and instructions.

Air Traffic Control Tower (ATCT): A facility that provides local air traffic control services to aircraft operating into and out of an airport. Air Traffic Control Tower facilities are located on the airfield maintaining an unrestricted view of airside facilities (i.e., runway, taxiways). They are typically Federal Aviation Administration operated, but can also operate under contract.

Airport Elevation: The highest point within an airport’s movement area.

Airport Improvement Program (AIP): A federal funding mechanism that provides grants for planning and capital improvement projects at public-use airports included in the National Plan of Integrated Airport Systems (NPIAS).

Airport Layout Plan (ALP): A graphic illustration of existing and proposed airport facilities (e.g. runways, taxiways, terminal buildings, navigation aids, etc.).

Airport Noise and Capacity Act of 1990 (ANCA): The congressional act that established the first national noise policy. The ANCA created a timeline for the phase out of Stage 2 aircraft (year 2000) and created a review and approval process governing the implementation of local airport use or access restrictions by airport proprietors.

Airport Sponsor: The recipient of Airport Improvement Program (AIP) grant funding. In a Part 150 study, the airport operator is identified as the Airport Sponsor, but local jurisdictions can also assume ‘airport sponsor’ status when applying for AIP funding for noise mitigation programs.

Airspace: Airspace, in aeronautical terms, refers to the three-dimensional structure of the atmosphere in which aircraft operate. Airspace is classified as either controlled or uncontrolled. In controlled airspace (known as Class A, B, C, D, or E), aircraft are provided with air traffic control services and are subject to operating according to specific rules, regulations, and procedures. Uncontrolled airspace (Classes F and G) may not include air traffic control requirements and relies on visual flight rules.

Ambient Noise Level: The level of noise that is all-encompassing within a given environment for which a single source cannot be determined. It is usually a composite of sounds from many and varied sources near to and far from the receiver.

Arrival (or Approach): A flight operation that encompasses the descent and landing of an aircraft on an airport runway.

Attenuation: The decrease in sound level that occurs due to the loss of acoustical energy as sound waves pass through a medium (such as air or water). Also due in part to the interaction between sound waves that travel directly from the source to the receiver and reflected waves that bounce off any surfaces (such as the ground or a building) while traveling from the source to the receiver.

Aviation Safety and Noise Abatement Act of 1979 (ASNA): A congressional act authorizing the Federal Aviation Administration to award grants under the Airport Improvement Program for noise mitigation projects. The ASNA states that in order to access funding for noise mitigation projects, the project must be identified in an airport's Noise Compatibility Program (NCP) per 14 CFR Part 150.

Aviation Easement: An agreement which secures the right of flight with inherent noise and vibration above the surface, the right to remove existing obstructions, and a restriction against the establishment of future obstructions.

Building Code: A minimum set of standards for the structural safety of buildings set and enforced by local governments.

Building Permit: A written authorization by a municipality for new construction, additions to pre-existing structures, or major renovations.

CFR: Code of Federal Regulations.

CFR Part 150: Titled Airport Noise Compatibility Planning, CFR Part 150 establishes standards for the documentation of noise exposure in the airport environs, as well as procedures for obtaining Federal Aviation Administration approval of programs to reduce or eliminate incompatibilities between aircraft noise and surrounding land uses. A Part 150 study is comprised of both a set of Noise Exposure Maps which depict existing and future five-year forecast conditions and a Noise Compatibility Program, which identifies strategies to reduce, mitigate, and prevent existing and future incompatible land uses in the vicinity of an airport. An approved Noise Compatibility Program is required to access Airport Improvement Program funding for mitigation programs.

Closed-Pattern Operation (Touch and Go): An aircraft training operation flown in a closed pattern (generally oval or rectangular) around the runway and within site of the Air Traffic Control Tower, if present. A closed pattern operation consists of five legs: upwind, crosswind, downwind, base leg, and final approach.

Commuter Aircraft: A certified air carrier operator typically configured with 30 seats or less. Commuter aircraft operate a published flight schedule and operate under CFR Part 121.

Contour: see noise contour

Daytime (Acoustic): The period beginning at 7:00 a.m. and ending at 10:00 p.m. local time.

Day-Night Average Sound Level (DNL): The 24-hour decibel-average sound level, in A weighted decibels, with a 10-dB penalty for sound levels occurring between 10 p.m. and 7 a.m. local time.

Decibel (dB): The term used to identify 10 times the common logarithm of two like quantities proportional to power, such as sound power or sound pressure squared, commonly used to define the level produced by a sound source.

Displaced Threshold: A runway threshold at a location other than the beginning of the runway, generally designated in order to provide suitable obstacle clearance or safe pavement conditions for arriving aircraft. The displaced portion of the runway may still be used for departing aircraft.

Distance Measuring Equipment (DME): Equipment used to measure distance in nautical miles from an aircraft to a navigational aid.

Eminent Domain: A governmental unit's power to condemn private property for public or civic use, with the provision that the owner will be justly compensated.

Enroute: The portion of a flight outside the terminal airspace of both the origin and destination airports.

Engine Run-up Area: A designated area on an airfield used for prolonged aircraft engine testing.

Enplanements: The number of passengers boarding an aircraft.

Environmental Assessment (EA): An analysis prepared, pursuant to the National Environmental Policy Act (NEPA), to assess the potential environmental impacts of a proposed Federal action, which contains sufficient detail in order for a Federal determination of either a Finding of No Significant Impact (FONSI) or the need to pursue an Environmental Impact Statement (EIS).

Environmental Impact Statement (EIS): An analysis prepared pursuant to the National Environmental Policy Act (NEPA) that discloses the significant impacts of a proposed Federal action and evaluates a series of alternatives. The process for completing an EIS is outlined in Order 5050.4B and Order 1050.1E.

Environmental Protection Agency (EPA): The federal agency responsible for natural resource protection and oversight of the release of toxins and other pollutants into the environment.

Equivalent Sound Level (Leq): The level of a constant sound which, in the given time period, has the same average sound energy as does the actual time-varying sound. The time interval over which the measurement is taken should always be specified. Typically Leq is derived from A-weighted sound levels, thus, Leq is the decibel-average level of the individual A-weighted sound levels occurring during the time interval. The Leq metric can provide an accurate quantification of noise exposure for a specific period, particularly for daytime periods when the nighttime penalty under the DNL metric is inappropriate.

Federal Aviation Administration (FAA): The federal agency under the Department of Transportation responsible for regulating aviation activity, certifying pilots, air carriers, air traffic controllers and aircraft, as well as operating the National Airspace System (NAS) in the United States.

Fee Simple Land Acquisition: Fee simple acquisition is the purchase of lands that may have sensitive environmental concerns. In the context of airport noise mitigation projects, acquisition is subject to the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Final Approach: The final leg of an arrival flight path, which is typically the straight-in segment of the operation, except during circling and offset approaches whereby aircraft would not be directly aligned with the arrival runway.

Fixed Base Operator (FBO): A private-sector airport tenant that offers services to General Aviation (GA) and CFR Part 135 operators including refueling, de-icing, parking, maintenance services, flight training and other ground services.

Fleet mix: A representation of aircraft types operating at the airport or operated by a specific airline or tenant.

Flight Plan: A record filed by pilots and air carrier dispatchers with a Flight Service Station (FSS) declaring flight intent and requesting clearance and routing information. A typical flight plan includes information on aircraft, type, onboard equipment, origin and destination, fuel on board, and requested routing.

Flight Track (or path): The three-dimensional flight trajectory traveled by aircraft from the start of the departure (takeoff roll) to the destination. Flight tracks for noise modeling usually are derived from radar data and are generalized for input into the Integrated Noise Model (INM).

General Aviation (GA): All aircraft operating under CFR Part 91 typically consisting of single and multi-engine propeller aircraft and business jet aircraft. General Aviation operations comprise all operations other than air carrier, air taxi, and military operations.

Geographical Information Systems (GIS): A group of software applications used to analyze, interpret, and visualize spatial data such as street, terrain, and demographic data.

Glide Slope: A vertically-guided path directed by a radio signal, which aircraft travel as they approach a runway on a precision approach, such as that offered by an Instrument Landing System (ILS). Glide slopes are indicated by a specific angle of approach, generally 3 degrees from a final approach fix to the runway threshold.

Global Positioning System (GPS): A constellation of orbiting satellites which provide position and time information to ground based and airborne receivers.

Hertz (Hz): The unit used to designate frequency. Specifically, the number of cycles per second.

Instrument Flight Rules (IFR): Flight during times when cloud cover and visibility are below published safety standards. Flight under Instrument Flight Rules conditions requires specific procedures, pilot certification requirements, and onboard instruments for aircraft navigation.

Instrument Landing System (ILS): A system consisting of a localizer (which provides runway centerline guidance), glide slope (which provides vertical guidance), outer and middle markers, and approach lights, which allows precision instrument approaches to runways during periods of low visibility.

Integrated Noise Model (INM): An integrated model required by the Federal Aviation Administration as the standard tool for the modeling of noise exposure resulting from aircraft operations at civilian airports in the U.S.

Knot: A unit of aircraft speed equal to 1 nautical mile per hour. 1 knot is equal to 1.15 (statute) miles per hour.

Land Use Compatibility: The ability of land adjacent to the airport to coexist with airport operations according to applicable federal, state, and local guidelines.

Land Use Controls: Regulations set forth by Federal, state, and local governments on the characteristics of development that may occur on a specific parcel of land, such as setback lines of buildings, zoning, or historic preservation guidelines.

Loudness: The attribute of an auditory sensation, in terms of which sounds may be ordered on a scale extending from soft (quiet) to loud. Loudness depends primarily upon the sound pressure of the source, but it also depends upon the frequency and wave form of the source.

Maximum Sound Level (L_{max}): The highest sound level measured during a single event in which the sound level changes value with time (e.g., an aircraft over-flight). The A-weighting is implied.

Mean Sea Level (MSL): An altitude indicated as feet above sea level.

Missed Approach: A flight procedure that redirects the aircraft along a predefined course when an approach to a runway is not feasible due to weather or other considerations.

Mitigation: The lessening of severity or intensity. In the aviation planning context, mitigation generally refers to measures taken to reduce noise exposure. Residential sound insulation programs are an example of noise mitigation because they reduce the transmission of sound through buildings

National Airspace System (NAS): The sovereign airspace under the control of the United States as defined by international law and governed by access and use restrictions.

National Environmental Policy Act (NEPA): A congressional Act which established the national policy for disclosing the potential environmental impacts of Federal actions. Compliance with NEPA requires the completion of an environmental document that outlines impacts that may significantly affect the quality of the human environment.

Navigation Aid: Typically, a ground-based facility designed to provide signal data to assist aircraft with navigation, approach and departure operations both within terminal airspace and in the enroute environment.

Nautical Mile: A unit of distance used in aviation; approximately 1.15 statute miles.

Noise: Disagreeable or unwanted sound.

Noise Abatement Procedure: A voluntary operational procedure for arriving and departing aircraft designed to reduce the impact of noise in a specific location.

Noise Attenuation: See Attenuation.

Noise Berm: A man-made structure or natural feature composed of either earthen or other materials to act as a mitigating barrier for the transmission of sound.

Noise Compatibility Program (NCP): A program that promulgates recommendations on the abatement and/or mitigation of existing impacts of aviation noise, and the prevention of future incompatibilities in areas identified as being significantly impacted by aircraft noise. A Noise Compatibility Program is created or updated as part of the CFR Part 150 process, following the completion of existing and future Noise Exposure Maps.

Noise Contour : A continuous line connecting a series of points of equal sound level values. The lines are generally drawn in 5-decibel increments so that they resemble elevation contours found in topographic maps except that the lines represent contours of equal noise level instead of elevation. Noise contours are generally used in depicting noise exposure around airports, highways and industrial plants. Noise contours are typically computed using noise models such as the FAA's Integrated Noise Model.

Noise exposure: The cumulative acoustic stimulation reaching the ear of a person over a specified time (e.g., a day, a work shift, or a lifetime).

Noise Exposure Map (NEM): Noise exposure contours overlaid on a background map which identifies future noise exposure conditions at an airport. An NEM is typically developed as part of the CFR Part 150 process.

Noise Reduction or Noise Level Reduction (NLR): The difference in sound levels between two adjacent areas or rooms. In the field of sound insulation, NLR is the difference between the outdoor noise level and the interior noise level. NLR combines the effect of the transmission loss performance of the built construction separating two areas or rooms, plus the effect of acoustic absorption present in the receiving room.

Nighttime (Acoustic): The period beginning at 10:00 p.m. and ending at 7:00 a.m. local time.

Operation: A departure, arrival, or closed pattern (touch and go) operation performed by aircraft at an airport.

Overflight: An aircraft operation that both originates and terminates at an airport outside of the airport of interest, yet transverses the terminal airspace.

Overlay District: A special zoning district which mandates regulatory standards for permitted land use and construction, in addition to existing zoning regulations.

Precision Approach Path Indicator (PAPI): A navigation aid on the end of a runway consisting of a single row of two to four lights which emit red or white beams depending on the altitude of the approaching aircraft.

Precision Instrument Approach Procedure: An instrument approach where vertical guidance is provided.

Propagation: The radiation of sound energy from a source to a receiver.

Reliever Airport: A general aviation airport that serves to accommodate air traffic that would otherwise use the region's primary commercial service airport.

Run-up: A maintenance operation conducted to test aircraft engines following routine or major maintenance or repair. Run-ups consist of engine tests at varying durations and power settings.

Runway Use Program: A program that indicates the preferred use of specific runways at an airport. Runway use programs may be designed to enhance noise mitigation to airport communities for arriving and departing aircraft. Programs are categorized as formal (defined and acknowledged in a Letter of Understanding, with mandatory participation) or informal (voluntary participation).

Sound: Minute vibrations that travel through air and can be sensed by the human ear. Sounds are measured by their intensity, frequency, and duration.

Sound Exposure Level (SEL): A time-integrated metric quantifying the total acoustic energy of an event transmitted to the listener. SEL represents the same acoustic energy of a time-varying noise event such as an aircraft overflight or passing automobile, however, for SEL that energy is normalized to a one second duration. SEL is the building block for calculating the Day-Night Average Sound Level (DNL) in the FAA's INM.

Sound Insulation: Methods of construction or modification designed to reduce the transmission of sound energy through a structure.

Sound Level Meter: A portable device that measures sound pressure levels.

Sound Pressure Level : A measure in decibels of the magnitude of the sound. Specifically, the sound pressure level of a sound, in decibels, is 10 times the logarithm to the base 10 of the ratio of the squared pressure of this sound to the squared reference pressure. The reference pressure is usually 20 micropascals.

Standard Instrument Departure Procedure (SID): A published instrument departure procedure which provides detailed instructions for an aircraft during the transition from the terminal area to the en route portion of flight.

Standard Terminal Arrival Route (STAR): A published instrument arrival procedure which transitions an aircraft from the en route environment into the terminal area. A STAR specifies operational criteria such as the rate of descent, specific routing directions, and communications for arrival to an airport.

Terminal Airspace: Airspace immediately surrounding an airport in which guidance or instructions are issued to aircraft by local air traffic control. The size and classification of Terminal Airspace depends on airport size and other airspace characteristics in its vicinity. Airspace surrounding Lehigh Valley International Airport is classified as Class D airspace during hours in which the Air Traffic Control Tower is open, and Class G airspace during other times.

Terminal Radar Approach Control (TRACON): A Federal Aviation Administration air traffic control facility providing radar separation and vectoring services to aircraft within the terminal airspace of medium and large hub airports.

Traffic Pattern: Standard routes flown by aircraft in relation to the active runway.

Very High Frequency Omni-directional Range (VOR): A ground-based navigation aid which transmits very high frequency navigation signals in 360 degrees. A VOR may be co-located with other navigation equipment, such as a Tactical Air Navigation (TACAN) or Distance Measuring Equipment (DME).

Visual Approach: An approach which allows an aircraft to visually proceed to land on a given runway.

Visual Approach Slope Indicator (VASI): An airport lighting facility which provides vertical guidance to aircraft during an arrival.

Visual Flight Rules (VFR): A series of rules which apply to aircraft operating by visual reference and “see-and-avoid” procedures. VFR governs flights operating in weather conditions with ceilings of 1,000 feet Above Ground Level (AGL) and at least three miles visibility.

Zoning: The classification of land into separately regulated areas which specify permitted land uses, density, design, and placement of structures within each boundary.