



WHITE PAPER FOR AIRPORTS COUNCIL INTERNATIONAL—NORTH AMERICA

**Initial Evaluation of Types of Effects that Could Result from Potential Change in FAA Noise
Significance Threshold to Airport Interests and Functions**

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This white paper summarizes some of the issues that ACI-NA and its member airports should consider as it monitors FAA research on airport noise annoyance and potential FAA policy changes that might result as it concludes its research.

BACKGROUND

Working toward the goal of achieving land use compatibility with aviation noise has greatly benefited the airport community over the last 50 years. The airport and aviation industries have made tremendous progress in reducing non-compatible land uses around airports, with a particular focus on residential and other noise-sensitive uses within the DNL 65 noise contour. As non-compatible land use has been reduced within the DNL 65 contours, and as new flight procedures have been introduced, many airports have experienced increasing community concern about noise exposure beyond these contours. These concerns threaten the ability of airports to meet growing capacity demands in a timely fashion.

Review of the actions leading to FAA's adoption of the DNL 65 land use compatibility guideline decades ago indicates that it was intended as a policy decision to be interpreted flexibly. Federal noise policy has always recognized that land-use compatibility decisions should be made at the local level. In addition, adoption of the DNL 65 guideline in the 1970s reflected a compromise between what was environmentally desirable and what was economically and technologically feasible at the time.

As described in Appendix A, FAA's reliance on DNL 65 as the threshold of residential land use compatibility is based largely (but not exclusively) on research regarding community annoyance to aircraft noise. FAA is currently conducting a comprehensive research study to update the noise annoyance 'dose-response' curve that forms that basis of the current policy. Based on other recent aircraft noise annoyance studies conducted outside the United States, it is likely that the research will suggest a higher level of annoyance for a given aircraft noise level than was estimated in the 1970s. In addition, the International Standards Organization (ISO) is currently evaluating a proposed revision to its current standard addressing the description, measurement, and assessment of environmental sound, which will reflect more recent data.

FAA has stated that it will reconsider its land-use compatibility guidelines when that research is complete (likely in the next 12 months). The extent to which technical and economic feasibility will play into that decision remains unclear, but FAA has stated that it intends to make a science-based decision in 2018. FAA has also clarified that any decision will continue to rely on current noise metrics like DNL, while a subsequent research phase will be conducted to evaluate whether alternative noise metrics exist that better reflect community annoyance.

This memorandum identifies issues related to various policy scenarios that we believe the FAA will likely consider based on a potential finding that there is more community annoyance at

given noise levels than assumed when FAA settled on the current DNL 65 standard. While this is not an exhaustive list of scenarios or potential issues, we believe it does address many of the main issues that airports should consider. The possible FAA policy options we identified were the following:

- No Change to Current Policy: Under this scenario, we assume that regardless of possibly-identified increased annoyance levels, FAA would conclude that current land-use compatibility guidelines (*i.e.*, the DNL 65 threshold of compatibility with residential land use) are sufficient. Further, this scenario assumes that FAA would not revise/ revoke its current sound insulation policy, which requires a two-step test for eligibility (DNL 65 outdoors, and DNL 45 indoors).¹
- Lower Outdoor Level of Residential Land Use Compatibility, but Maintain Current Sound Insulation Eligibility: This scenario assumes that FAA would modify the land use compatibility guideline to DNL 60 (or possibly 55), based on the results of the annoyance survey. However, it also assumes that FAA maintains its policy of providing sound insulation only for properties that meet the current two-step eligibility test (*i.e.*, indoor DNL greater than 45) and maintains other policies regarding the use of Airport Improvement Program grants, Passenger Facility Charge funds or airport revenue for other compatibility tools, such as the purchase of property or avigation easements.
- Lower Level of Residential Land Use Compatibility, and Modify Mitigation Eligibility: This scenario assumes FAA would modify the land-use compatibility guideline to DNL 60 (or possibly 55), based on the results of the annoyance survey. This scenario also assumes that FAA would re-evaluate and change its guidance requiring a DNL 45 indoor threshold.² FAA may also modify guidance on other forms of noise mitigation, such as property purchase, easement acquisition and other measures. However, because of the size of sound insulation programs and for the sake of simplicity, this white paper focuses on sound insulation.

While much of the discussion about the possibility of revised land use compatibility guidelines has been focused on possible mitigation cost implications (especially under the third scenario), there are a number of implications for a broad range of airport issues. The table below summarizes implications of various policy options in a number of categories:

¹ As a result of Program Guidance Letter (“PGL”) 12-09, “Eligibility and Justification Requirements for Noise Insulation Projects” (which has subsequently been cancelled as a stand-alone PGL and incorporated into the updated AIP Handbook, FAA Order 5100.38D), FAA required acoustical testing (indoors) of homes in DNL 65 contours to determine eligibility for sound insulation. It is unclear at this time what percentage of properties currently being tested in programs around the country meet this two-step eligibility, because some regions have interpreted the testing requirements differently.

² Note that FAA’s assessment is focused on exterior noise levels and not interior noise levels. However, it can likely rely on existing research to justify changes in the interior noise level threshold for sound insulation eligibility. FAA may decide to refer the issue to an interagency noise committee.

- Legal Liability
- Airport Development (Planning and NEPA)
- Airspace Use and Changes, Including NextGen, PBN and Metroplex Changes
- Land Use Compatibility
- Sound Insulation Programs
- Community Engagement
- Relationship with Airlines and Other Users
- Economic Impact
- Part 150 Program
- Land and Easement Acquisition
- Noise Monitoring
- Airport Noise Management Costs

RECOMMENDED POLICY PRINCIPLES

At this stage, it would be premature to formulate or advocate any specific policy proposals. However ACI-NA has developed the following high-level principles that should be applied as results from the research are reviewed and policy changes contemplated:

1. **Science-based:** Any changes to federal policy on noise must be based on the latest, sound science. Results from the FAA research projects should be made public in a usable form.
2. **Stakeholder engagement:** Any changes in noise policy must be preceded by a robust stakeholder engagement effort by the FAA, with meaningful dialogue and opportunities for input from the airport industry.
3. **Roles and Responsibilities:** The FAA must take ownership of their role regarding the creation of, or change in aviation noise, and clearly communicate their role to the public and stakeholders.
4. **Transparency:** The FAA must communicate the policy development process, any changes in policy, and the justification for the changes clearly to stakeholders.
5. **Funding:** Airport funding is already extremely constrained, and airports should not be mandated to pay more regardless of the outcome from the policy discussions.

POTENTIAL EFFECTS OF CHANGE IN FAA NOISE SIGNIFICANCE THRESHOLD TO AIRPORT INTERESTS AND FUNCTIONS

Airport Program Impact/Possible Policy Change	No Change To Current Policy	Lowering DNL Threshold of Impact; No Change to Guidance Limiting Sound Insulation	Lowering DNL Threshold; Current Guidance Limiting Sound Insulation Revised To Allow Greater Scope of Sound Insulation
Legal Liability	<ul style="list-style-type: none"> • Some communities and neighbors have suggested that not changing FAA threshold in light of changed scientific understanding may cause reassessment of criteria for takings. • This risk appears small unless FAA studies show much larger impacts at lower levels than expected. Airports (and military branches) rely on a long history of precedent regarding takings. • FAA’s noise threshold currently plays a modest role in judicial criteria for overflight takings in some jurisdictions. 	<ul style="list-style-type: none"> • May lead to more inverse condemnation or nuisance suits based on desire by property owners to test impacts. • May cause courts to expand areas in which airport takings or nuisance are found; current case law is mixed among states regarding whether courts significantly weight noise levels and thresholds in takings or nuisance analyses. • Lack of sound insulation may create somewhat more risk. 	<ul style="list-style-type: none"> • May lead to more inverse condemnation or nuisance suits based on desire by property owners to test impacts. • May cause courts to expand areas in which airport takings or nuisance are found; current case law is mixed among states regarding whether courts significantly weight noise levels and thresholds in takings or nuisance analyses. • Greater scope for sound insulation tool may somewhat reduce risk.
Airport Development (Planning, NEPA, Section 4(f) and Related Laws)	<ul style="list-style-type: none"> • Some communities and neighbors have suggested that not changing the FAA threshold in light of changed understanding may expose it to greater risk that environmental findings are not based on “best available science.” • This risk appears modest unless FAA studies show much larger impacts at lower levels than expected; FAA can rely on long history of favorable precedent and deferential standard of review from courts. • Remaining with a threshold that is viewed with suspicion by neighboring 	<ul style="list-style-type: none"> • Expands scope of noise and land use evaluation in NEPA, Section 4(f) and other studies, as well as mitigation commitments. This will include more homes, residents and other sensitive properties included in areas of incompatible noise levels. • Increases number of airspace and development projects that may require EAs or EISs. One area of uncertainty is whether the current FAA requirement of a 1.5 dB increase for a significant impact would remain. • May alter the “reportable impacts” requirements below DNL 60 to require 	<ul style="list-style-type: none"> • Expands scope of noise and land use evaluation in NEPA, Section 4(f) and other studies, as well as mitigation commitments. This will include more homes, residents and other sensitive properties included in areas of incompatible noise levels. • Increases number of airspace and development projects that may require EAs or EISs. One area of uncertainty is whether the current FAA requirement of a 1.5 dB increase for a significant impact would remain. • Provides another mitigation tool to reduce community concerns and

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	<p>communities and limits the use of sound insulation for mitigation will likely continue community concerns about project noise impacts.</p>	<p>evaluating and reporting impacts at even lower levels. This will bring into question the accuracy of the modeling tools that may not have sufficient fidelity at less than 45 DNL.</p>	<p>demonstrate responsiveness to courts.</p> <ul style="list-style-type: none"> • May alter the “reportable impacts” requirements below DNL 60 in the 60 and 45 to require evaluating and reporting impacts at even lower levels. This will bring into question the accuracy of the modeling tools that may not have sufficient fidelity at less than 45 DNL. • May raise questions about the need to reopen prior approved mitigation measures for already approved projects.
<p>Airspace Use and Changes, Including NextGen, PBN and Metroplex Changes</p>	<ul style="list-style-type: none"> • Potential for escalating tension associated with community concerns about noise below DNL 65. • FAA’s commitments to provide better coordination with airports and communities on airspace and NextGen issues have not been fully realized. • Likelihood of greater airport, FAA and community tension. 	<ul style="list-style-type: none"> • Airports may find (and FAA may show) more flexibility in proposing/evaluating noise abatement measures such as airspace changes and runway use as noise abatement measures in Part 150 Studies and/or as mitigation in the NEPA context. • NextGen and other procedures will likely require greater level of environmental review, community engagement and mitigation. 	<ul style="list-style-type: none"> • Airports may find (and FAA may show) more flexibility in proposing/evaluating noise abatement measures such as airspace changes and runway use as noise abatement measures in Part 150 Studies and/or as mitigation in the NEPA context. • NextGen and other procedures will likely require greater level of environmental review, community engagement and mitigation. • Mitigation may include sound insulation, easement purchase or other measures, with questions regarding who should pay and the adequacy of funds to cover an extended area of impact.
<p>Land Use Compatibility</p>	<ul style="list-style-type: none"> • Airports and surrounding jurisdictions 	<ul style="list-style-type: none"> • Airports potentially provided an 	<ul style="list-style-type: none"> • Airports potentially provided an

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	<p>still need to provide zoning and other tools to reduce land use incompatibility.</p> <ul style="list-style-type: none"> Leaving the FAA threshold at DNL 65 will make it somewhat more difficult, but certainly not impossible, to justify land use restrictions beyond the DNL 65 contour. 	<p>additional measure of justifiable land use planning buffer, though this may be problematic in densely populated areas, where buffers are more difficult and extensive to provide.</p> <ul style="list-style-type: none"> It will be easier to justify more extensive buffers both politically and legally. 	<p>additional measure of land use planning buffer, though this may be problematic in densely populated areas, where buffers are more difficult and extensive to provide.</p> <ul style="list-style-type: none"> It will be easier to justify more extensive buffers both politically and legally. Providing soundproofing retrofits in a wider area may make it easier to require tougher restrictions for new construction.
Sound Insulation Programs	<ul style="list-style-type: none"> It is foreseeable that sound insulation programs at many airports would conclude due to the DNL 65 threshold and Program Guidance Letter. New programs would result from the few airports that have not already conducted extensive programs, and airports that have new impact identified through NEPA analyses. Future use of noise set-aside funds in the Airport Improvement Program may need to be considered. There may be political pressure to reprogram these funds if they are not benefitting a wide range of airports. 	<ul style="list-style-type: none"> Would likely cause little or no additional sound insulation cost to airport, airlines and FAA due to DNL 45 interior standard. Would likely have adverse community reaction and pressure on airport development and airspace projects. 	<ul style="list-style-type: none"> Would cause significant additional costs to airports, airlines and FAA. Would provide another tool available to reduce community concerns about airport development and airspace projects <i>[Note: Airports should consider the efficacy of such programs for reducing community opposition to projects, reducing noise taking litigation or achieving other aims.]</i>
Community Engagement	<ul style="list-style-type: none"> There is likely to be continued tension with communities relating to their perceived impacts and FAA thresholds. Lack of consistency between 	<ul style="list-style-type: none"> There may be expectation that changed threshold would result in additional funding of sound insulation or other measures. 	<ul style="list-style-type: none"> Airport engagement with communities may be perceived as more “honest” if it captures areas of real noise concern outside of DNL 65 dB.

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	<p>thresholds and community concerns may manifest itself in more opposition to airport development and airspace projects, likely resulting in poorer relationships.</p>	<ul style="list-style-type: none"> • If that does not happen, communities will want something, but airports have little they can legally provide. • If not, there may be more opposition to airport projects. • Airport engagement with communities may be perceived as more “honest” if it captures areas of real noise concern outside of DNL 65 dB. 	<ul style="list-style-type: none"> • Likely a better result than not changing PGL, but many community issues still well outside DNL 60 or even 55.
Economic Impact	<ul style="list-style-type: none"> • Less expenditure on sound insulation or property acquisition, affecting contractors, suppliers, and property owners. • May hamper ability to increase capacity (airspace or infrastructure) due to community opposition, prolonging implementation and increasing costs. 	<ul style="list-style-type: none"> • May be costs associated with property acquisition or other programs outside of DNL 65. • Reduced threshold of significance could have effects on property values and community structure, especially if no insulation is possible. This effect is speculative, however. 	<ul style="list-style-type: none"> • Impact of sound insulation programs to local construction firms and property values in neighborhoods. • Reduced threshold of significance could have effects on property values, although this impact may be mitigated through sound insulation. • Possibly some positive energy efficiency effects.
Relationship with Airlines and Other Users	<ul style="list-style-type: none"> • Airlines and general aviation interests are likely to support maintaining current thresholds, both to reduce future costs and avoid more review of aviation projects and decisions. 	<ul style="list-style-type: none"> • Users are likely to oppose a lowering of the compatibility threshold, but support retaining the guidance regarding sound insulation eligibility. • Airport support for lower thresholds would likely cause some tension with user groups. 	<ul style="list-style-type: none"> • Users are likely to oppose a lowering of the compatibility threshold and any change to the guidance regarding sound insulation eligibility. • Airport support for lower thresholds would likely cause some tension with user groups.
Part 150 Program	<ul style="list-style-type: none"> • Value of Part 150 will largely be to develop community relations, as all practical measures outside DNL 65 would be ‘rejected for purposes of Part 150’ and sound insulation becomes a risky measure (only a small proportion 	<ul style="list-style-type: none"> • Airports would generally update Part 150 documents/programs to reflect new land use compatibility criterion. • Under federal law, Part 150 noise exposure maps can also limit noise takings liability for subsequent 	<ul style="list-style-type: none"> • Airports would generally update Part 150 documents/programs to reflect new land use compatibility criterion. • Insulation will become a feasible option for airports again. • Under federal law, Part 150 noise

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	<p>of homes are eligible under Program Guidance Letter).</p> <ul style="list-style-type: none"> Under federal law, Part 150 noise exposure maps can also limit noise takings liability for subsequent purchasers. However, it may be difficult to use it as a community relations tool if there are few or no significant tools that could mitigate noise impacts. 	<p>purchasers.</p> <ul style="list-style-type: none"> However, there would still be limited tools to address impacts to newly-identified areas other than requests to FAA or airlines for changes in routes or procedures. 	<p>exposure maps can also limit noise takings liability for subsequent purchasers.</p>
Land and Easement Acquisition	<ul style="list-style-type: none"> As noise contours expand again over the next decade some new areas for acquisition may emerge. There will still be pressure to dispose of noise disposal land acquired during periods of higher noise levels. 	<ul style="list-style-type: none"> Airports likely to be eligible to purchase additional property or easements as noise mitigation buffer. Would reduce the pressure to dispose of land acquired for noise compatibility, because many properties currently outside of the DNL 65 contour would be considered incompatible. May also make it more challenging to dispose of some land currently outside DNL 65 for residential or other noise-sensitive uses. However, disposal for other purposes is unlikely to be affected. 	<ul style="list-style-type: none"> Airports like to be eligible to purchase additional property or easements as noise mitigation buffer. Would reduce the pressure to dispose of land acquired for noise compatibility because many properties currently outside of the DNL 65 contour would be considered incompatible. •May also make it more challenging to dispose of some land currently outside DNL 65 for residential or other noise-sensitive uses. However, disposal for other purposes is unlikely to be affected.
Noise Monitoring	<ul style="list-style-type: none"> Little change to current monitoring or policies. 	<ul style="list-style-type: none"> Eligibility for FAA funding of noise monitors to lower noise levels. 	<ul style="list-style-type: none"> Eligibility for FAA funding of noise monitors to lower noise levels.
Airport Noise Management Costs	<ul style="list-style-type: none"> The effects are unclear. While the standards and tools may not change, community concern over time may increase, leading to greater costs in 	<ul style="list-style-type: none"> The effects are unclear. While there would be more area and people covered within “significantly affected” areas, the net effect on noise programs 	<ul style="list-style-type: none"> Costs associated with sound insulation programs and management would likely increase.

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	managing meetings, flight tracking, complaints and other elements.	is uncertain. The increased population and identified concern could increase costs. However, the acknowledgement of greater impact could reduce community concern that its needs are not being heard. Because noise mitigation tools may not change, community concern over time may increase, leading to greater costs in managing meetings, flight tracking, complaints and other elements.	

Appendix A. History of the Adoption of DNL 65

Federal noise compatibility guidelines have traditionally recognized the need to balance environmental goals with technical and economic feasibility. Development of our current noise/land use compatibility guidelines was initiated over 35 years ago. While substantial improvements have been made on aircraft noise reduction during this time, the current guidelines have not been revised since they were formalized over 25 years ago.

A. The EPA and the Noise Control Act of 1972

The EPA was required by the Noise Control Act of 1972ⁱ to conduct a study of the “implications of identifying and achieving levels of cumulative noise exposure around airports.” The selection of a measure of cumulative noise exposure was to correlate with human responses regarding hearing loss, sleep and speech interference and annoyance, and the identification of maximum permissible levels was based on the protection of the public health and welfare. The measure of cumulative noise was the “Day-Night Average Sound Level” or “Day-Night Level” or DNL.ⁱⁱ In considering minimizing speech interference both outdoors and indoors, minimizing annoyance (percent highly annoyed), complaints and community reaction, the study concluded that “...to achieve an environment in which no more than 20% of the population are expected to be highly annoyed and no more than 2% actually to complain of noise, the outdoor **day-night average sound level should be less than 60 decibels**³. Higher noise levels must be considered to be annoying to an appreciable part of the population, and consequently to interfere directly with their health and welfare.” (emphasis added)

The Act also required the EPA to publish “information on the levels of environmental noise the attainment and maintenance of which in defined areas under various conditions are requisite to protect the public health and welfare **with an adequate margin of safety**” (emphasis added). This requirement resulted in what is now commonly referred to as “The Levels Document”ⁱⁱⁱ, which recommended that to provide this protection, the level should not exceed DNL 55. That level was based on applying a 5 dB margin of safety to a recommended threshold of DNL 60.

B. The Maryland Aviation Administration

The Maryland Aviation Administration’s (MAA) noise policy as set forth in the Maryland Environmental Noise Act of 1974^{iv} was developed concurrently with the EPA work, and by the same team of scientists;⁴ it is generally considered to be a model for FAA’s Part 150, discussed later. In its report *Selection of Airport Noise Analysis Method and Exposure Limits*,^v MAA set

³ Some may wonder whether the Task Group’s annoyance data are outdated when compared with current thinking and the Schultz curve which shows roughly 12% highly annoyed at 65 dB Ldn. In fact, the Schultz curve contains data from all transportation sources. Current results for aircraft only are much closer to the 20% at 60 dB Ldn. (Miedema, H.M.E. and C.G.M. Oudshoorn, “Annoyance from Transportation Noise: Relationships with Exposure Metrics DNL and DENL and Their Confidence Intervals” *Environmental Health Perspectives*, Vol. 109 No. 4, 2001, pp. 409-416) (Fidell, S. and L. Silvati “Parsimonious alternatives to regression analysis for characterizing prevalence rates of aircraft noise annoyance,” *Noise Control Eng. J.* 53(2), 2004 Mar-Apr)

⁴ The EPA’s Task Group 3 study, the “The Levels Document” and the Maryland Noise Act and associated regulations were authored by many of the same people including Ted Schultz and others of Bolt Beranek and Newman.

DNL 65 as its official noise limit for residential land use. The report discusses the challenge of setting noise limits in the context of economic and technical realities:

The choice of acceptable noise limits can never be based only upon the relationship between noise exposure and the corresponding effects upon people. Considerations of the economic and technical feasibility must also enter into the decision. Setting the balance between criteria for an acceptable noise environment and the cost (in time and money) of achieving it, is the proper concern of government, not the scientist.

In discussing the apparent contradiction between EPA's conclusions regarding a long-term goal of DNL 55 and MAA's recommendation of DNL 65, the report had this to say:

We emphasize immediately that EPA's Levels Document was published to present information as required by the Noise Control Act; the noise levels identified therein... do NOT constitute EPA regulations or standards since they deliberately do not take into account cost or technical feasibility, or whether or not, in any particular situation, it would be desirable to undertake noise abatement activities that will undoubtedly interfere with other activities of value. Throughout the Document the words "identified level" are used to express the environmental noise levels whose attainment would "protect the public health and welfare with an adequate margin of safety". The words "goals", "standards" or "recommended levels" are avoided as inappropriate, because neither Congress nor EPA has concluded that the identified levels should be adopted as limits or standards by states and localities. This is a decision that the Noise Control Act clearly leaves to the states and localities themselves.

Ultimately then, the report recommended that MAA adopt the following proposed limits for cumulative noise exposure for residential land use, in terms of DNL, recognizing not only the work of EPA's Task Group 3, and the significance of the "adequate margin of safety" but also the effects of changing technology and feasibility:

- DNL 65, Effective 1 July 1975
- DNL 60, Effective when U.S. fleet noise level is reduced 5 dB below 1 July 1975 level⁵

C. FAA's Noise Policy

In the 1976 Noise Policy⁶, the FAA recognized that policy must achieve a balance between what is desirable and what is technologically and financially achievable:

The complex division of legal authority and practical responsibility among airport proprietors, federal, and local government agencies, air carriers, and manufacturers calls for a clearer understanding, first, of what is technologically and financially attainable and, second, of how each of these parties can/and must perform those functions for which it is uniquely suited.^{vi}

⁵ FAA estimates that the US fleet has achieved nearly 20 dB noise reduction since 1975, and that the number of people exposed to "significant" noise levels in the U.S has decreased from nearly 8 million in 1975 to somewhat less than 500,000 in 2000.

⁶ The 1976 Noise Policy is still the official policy on record. The FAA presented a draft updated policy in 2000, but it was never adopted.

The Federal Aviation Administration's noise program is guided by the Aviation Noise Abatement Policy and the Aviation Safety and Noise Abatement Act of 1979 (ASNA). ASNA required the FAA to:

- (1) establish a single system of measuring noise that (a) has a highly reliable relationship between projected noise exposure and surveyed reactions of individuals to noise; and (b) is applied uniformly in measuring noise at airports and the surrounding area;
- (2) establish a single system for determining the exposure of individuals to noise resulting from airport operations, including noise intensity, duration, frequency, and time of occurrence; and
- (3) identify land uses normally compatible with various exposures of individuals to noise.^{vii}

The Federal Interagency Committee on Urban Noise (FICUN) was constituted to develop land use compatibility standards for all federal agencies. The FICUN land use compatibility guideline of DNL 65 was incorporated in Part 150. The 1980 FICUN report also noted that HUD, DOT, and EPA recognized DNL 55 "as a goal" but not as a "regulatory goal" because (in essence) it did not consider economic and technical feasibility, and did not reflect the needs and desires of any particular community.

Federal Aviation Regulation Part 150^{viii}, Airport Noise Compatibility Planning, was first approved in 1980. FAR Part 150 identifies DNL as the appropriate noise metric, and includes a land use compatibility table in Appendix A, which states "all land uses are considered to be compatible with noise levels less than Ldn 65 dB. Local needs or values may dictate further delineation based on local requirements or determinations"^{ix}.

FAA Order 1050.1F, stipulates the threshold of "significant impact" for evaluating a proposed airport development project: if a parcel of noise sensitive land use is exposed to a project-related increase in noise level of 1.5 dB or more DNL, and that location lies within the DNL 65 noise contour for the "with action" condition, then the location is considered to be significantly impacted by noise and must be identified as such in environmental evaluations. Incompatible land uses include residences, schools, hospitals, places of worship and other uses as specified in Part 150.

In 1992, the Federal Interagency Committee on Noise (FICON)^x recommended that in addition to significant impacts, less than significant noise level changes also be identified for noise sensitive locations exposed to project-related increases. FICON recommended reporting any changes in DNL of 3 dB or more between DNL 60 and 65 and increases of DNL 5 dB or more between the DNL 45 and 60 contour. The FAA's subsequent Air Traffic Noise Screening (ATNS) procedure^{xi} further emphasized the importance of these changes in DNL, so that they, also, are now included in FAA Order 1050.1E, though these recommendations only apply to cases where the significant threshold (DNL 1.5 dB or more at or above DNL 65) is met or exceeded.

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- ¹ The Noise Control Act of 1972 (Public Law 92-574).
 - ² Von Gierke et al, *Environmental Protection Agency Aircraft/Airport Noise Study Report: Impact Characterization of Noise Including Implications of Identifying and Achieving Levels of Cumulative Noise Exposure*, July 1973.
 - ³ US Environmental Protection Agency Office of Noise Abatement and Control, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974.
 - ⁴ Transportation Article, §5-805, 5-806, and 5-819, Annotated Code of Maryland.
 - ⁵ Maryland Department of Transportation State Aviation Administration, *Selection of Airport Noise Analysis Method and Exposure Limits*, January, 1975.
 - ⁶ Department of Transportation, Federal Aviation Administration, *Aviation Noise Abatement Policy*, November 18, 1976. An updated draft policy was proposed in 2000, but was never adopted.
 - ⁷ Department of Transportation, Federal Aviation Administration, *Aviation Safety and Noise Abatement Act*, 1979.
 - ⁸ 14 CFR Part 150, Dec 18, 1984.
 - ⁹ Table 1—Land Use Compatibility with Yearly Day-Night Average Sound Levels, Appendix A, 14 CFR Part 150, Dec 18, 1984. Note that DNL and Ldn are both commonly used to abbreviate the Day-Night Average Sound Level.
 - ¹¹ *Federal Agency Review of Selected Airport Noise Analysis Issues*, Federal Interagency Committee on Noise, Washington, D.C., August 1992.
 - ¹² Air Traffic Noise Screening Procedure, Version 2.0, January 1999.