AN "INCLUSIVE" APPROACH TO NOISE PLANNING AND ANALYSIS

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The Traditional Approach

The traditional approach to noise planning and analysis around the nation's airports is an "exclusive" process that defines some people as having a "significant" noise problem while others are relegated to second-class status when considering solutions. This alienates many citizens, who develop a distrust of airport officials and often become the passionate opposition to airport growth projects. So who feels excluded or alienated, and why? Is there a better approach to airport noise planning and analysis that includes most, if not all citizens who are potentially affected, and particularly those within the defined noise "study area," but who may be outside the official noise contours? Perhaps the answers lie in a fresh approach to the airport noise planning and analysis process.

Airport noise studies generally start by defining a "study area," the size of which is often determined by estimating how much area is needed to show the lowest selected noise exposure contour. Every FAA funded airport noise study contains a set of day/night average sound level (DNL) contours that show noise exposure at and above DNL 65 dB, usually in 5 dB increments up to a level of DNL 80 or 85 dB that is on the airport near the runways.

Because FAA policies, regulations and guidelines define DNL 65 dB as the threshold of "significant impact", they do not require study results to show aircraft noise exposure at levels below DNL 65 dB. The result is that most airport and local officials elect not to show exposure around their airport at lower levels. While a few bold airport officials dare to show exposure out to the DNL 60 dB contour or more rarely the DNL 55 dB contour, the vast majority defer to the FAA guideline. Thus, all citizens who reside in "moderate" exposure areas beyond the outer noise contour shown in the noise study documentation are "excluded" from the noise exposure analysis. Of that excluded population, those that are most sensitive to noise generally comprise the vocal opposition to the study results and/or the proposed project or growth plan. Those who reside within the defined study area, but outside the contours, are likely the ones who will feel most alienated by the study. They tend to attack the DNL metric as flawed or the 65 dB threshold as too high to adequately address impacts. Given that most noise complaints around airports come from persons residing beyond the DNL 65 dB noise contour, it is clear that the general approach to conducting noise planning and analysis studies needs improvement.

This need for improvement was illustrated by a recent survey of airport community involvement efforts that showed that, among studies of all types, the community was satisfied with the outcome in only 24% of the cases. This represented the assessment of all respondents – airport staff members, consultants, and community members. Further, the various stakeholders reported that their attitudes became more polarized as the study progressed rather

than converging on a common understanding of what a satisfactory outcome might look like.

Despite the public involvement program, many study participants and observers ended up feeling frustrated about the process.

A Better Approach

Surely, there must be a better way! The authors are convinced that any noise study approach that is more "inclusive" of the affected citizens residing outside of the DNL 65 dB noise contour will yield more positive results. Perhaps the best starting point is to identify the noise study objectives.

If the noise study is part of an environmental assessment for a proposed airport project or a component of master planning, the main objective is to win approval for the proposed project or acceptance of the master plan. If the study is a Noise Compatibility Plan (NCP) under Federal Aviation Regulations, Part 150, the primary objectives are to identify and consider abatement and mitigation measures that minimize noise exposure, support local noise standards, address non-compatible land uses, and improve credibility and communication among all stakeholders. ("Abatement" means reduction of noise at the source, and "mitigation" means reduction of impact at noise sensitive locations).

The Greatest Challenge

Gaining public acceptance and support for a project, plan recommendations, and long term growth to meet demand is often the greatest challenge. Project officials must ask themselves: "What approach to noise planning and analysis will best serve the purpose and objectives of both the immediate project and the long-term demand for airport growth?" "How do we optimize communication, minimize conflict, and enhanced credibility with the affected public?"

The answer is: "carefully planned public outreach designed to effectively include all stakeholders." By applying a more inclusive approach, study officials can expect to gain far wider acceptance and support for their results. The reason is simple. Showing noise exposure levels throughout the entire study area grants formal recognition of all those citizens who believe they have a noise problem. By acknowledging them, study officials communicate that the complaints are legitimate and that potential alternatives to address noise concerns throughout the entire study will be considered. This is not a commitment to expend scarce resources mitigating noise farther and farther from the airport. It is, rather, a simple acknowledgement that people throughout the study area are bothered by noise. By following through on the promise to *consider* measures that can help people at various noise exposure levels, study officials build trust and credibility between the airport and the community. This results in broader pubic acceptance of the study findings, conclusions and recommendations.

Critical elements of an effective study plan include, but are not limited to, the size of the study area, identification of all stakeholders, open and continuous communication, calculation and presentation of noise exposure in terms that are easily understood, and identification and consideration of all viable mitigation and abatement measures.

Effective Study Planning

The primary considerations in determining the size of the study area are to include all areas where citizens have expressed concern and to also include areas where some potential for mitigation or abatement exists, even if those areas do not usually generate complaints. An area of complaint should not be excluded from the study area even if there does not appear to be a potential for mitigation or abatement. It is far better to let the formal study process determine there is no potential for mitigation or abatement in any particular area than to exclude a neighborhood or community from the study in what may appear to be an arbitrary manner.

A successful study plan will include a process to identify all stakeholders in the study area and

insure their representation and participation. Stakeholders include not only citizens residing or working in the study area, but airport officials, aircraft operators, other airport tenants, Federal and state government officials, and local elected officials. Active participation of elected officials greatly improves the chances that the study recommendations will be implemented. Their participation also tends to increase the credibility of airport officials in the eyes of the public, which in turn can enhance the chances of approval when the noise study is part of a master plan or an environmental assessment for a project. In the case of a Part 150, affected citizens are far more likely to support mitigation measures that require noise disclosure or extra sound insulation in new construction if they see their elected representatives actively participating and supporting such measures. After all, noise study recommendations are not worth much if they are not implemented.

All ideas must be widely communicated among study participants and the public to identify viable alternatives and to eliminate nonviable alternatives. To achieve that objective, frequent and open communication must occur throughout the study. This is not a call for more expensive public hearings or workshops, but rather a suggestion that less formal continuous communication means be incorporated into the study, such as a project website, chat rooms with project officials, email discussions, and a telephone contact. A two-way flow of information during a noise study insures that everyone with an idea is heard and that study officials stay in touch with public sentiment each step of the way. All too often a flood of negative feedback is forthcoming only when the draft study report and recommendations are circulated for comment, because until then the general public is unaware of the proposed alternatives and has not been given much opportunity to express individual views.

An even more effective strategy is to engage in a regular dialogue with the surrounding communities before a formal study commences. A recent survey of airport community involvement efforts showed that the single best predictor of community satisfaction with the outcome of a study was the type of relationship the airport had with the community *before* the study began. When the airport has an active communication program that facilitates meaningful two-way communication on a regular basis, a foundation is laid for a much more effective study process. On the other hand, when people suspect that the airport is only soliciting their input because the FAA "made them do it," and when they further believe that their comments will be relegated to an appendix that no one will ever read, the benefits of public outreach are lost and mistrust continues. In this situation, the airport must try even harder to convince people that outreach efforts are genuine and that public comments will be taken seriously.

This disconnect between airports good intentions and continued community skepticism is also borne out by our survey results. When asked how much of a role in decision-making was given to community members, airport respondents typically assessed the role as greater than the community members themselves reported it to be. In other words, even when the airport believed it was asking for extensive public comment, people continued to feel that no one was listening to them. This may be due to the fact that, when airports factor public comment into their process they neglect to tell the public how they have done so. This is why the regular two-way communication is so important for the inclusive approach. Not only must airports solicit public comment, they must take the comments into careful consideration and then publicize how the comments have been used in the study process.

Effectively Communicating Noise Exposure

As stated previously, communicating noise exposure to everyone in the defined study area is the main premise of the "inclusive" noise study approach. Study officials who are persuaded to adopt a more inclusive approach must decide how best to communicate exposure to their stakeholders. It is widely accepted that the DNL metric is appropriate for land use planning and implementing noise mitigation measures, but it often fails to clearly communicate noise exposure to the general public because it is an average noise level whereas people notice

individual noise events. The Federal Interagency Committee on Aircraft Noise stated in a 2002 report: *"FICAN finds that Supplemental metrics provide valuable information that is not easily captured by DNL. Supplemental metrics are particularly useful for assessing the effects of aircraft noise on interference with activities such as sleep and speech. In these cases, the use of metrics such as single exposure metrics can provide a more meaningful estimate of interference than a single DNL estimate."* Noise metrics other than DNL are better suited to communicating exposure in terms of how many loud events will occur every day at any given place in a study area or how much time out of a day aircraft noise will be at or above noticeable levels. These supplemental noise metrics are referred to as Number-of-events Above (NA) and Time Above (TA).

Ideally, exposure is communicated in all of these metrics. An entire study area map can be overlaid by a grid, with each block (usually square) ranging in size from perhaps a few hundred to a thousand feet or more on a side. The average DNL value for each block can be calculated and displayed in each block, and the boxes can be shaded with different colors for DNL values in each 5 or 10 dB range. The result is a map showing noise exposure for the entire study area, and the color coding instantly distinguishes the higher exposure areas from the lower exposure areas as shown in Figure 1 below. The number of events above the selected threshold value (such as a maximum level (L_{max}) of 65 dB) and the amount of time each day aircraft noise is above that threshold can then be calculated for each grid block. When these values are also presented on the same grid map, anyone in the study area can find the grid block(s) of interest and see the DNL along with the corresponding NA and TA values.

By counting the loudest events, the NA and TA values in each grid block represent the major contributors to the DNL for that grid block. When a low threshold such as 65 dB L_{max}) is used, the NA and TA values represent very close to 100 percent of the DNL value but provide a more meaningful measure of the impact. Everyone can relate to a metric that tells them how many times a day the noise will interrupt their conversation. The public generally finds the NA and TA metrics far easier to understand than DNL, and by breaking it down into its component parts, the public can better comprehend the DNL metric.

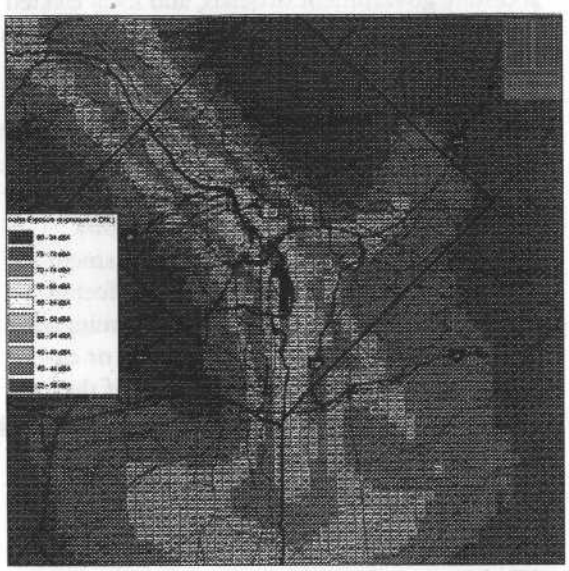

Figure 1

Key Benefits of the "Inclusive Approach"

Study officials must understand that by showing exposure throughout the selected study area, they will raise a public expectation that all viable alternatives to reduce noise throughout the entire study area will be seriously considered. Of course, identifying the viable alternatives is a primary objective of adopting a more inclusive study approach in the first place. Only by analyzing noise exposure beyond the traditional DNL 65 dB noise contour can study officials identify opportunities to shift flight tracks and distribute operations in a manner that minimizes noise exposure in sensitive locations. Credibility is increased by presenting the full noise picture even when opportunity to modify flight procedures is limited, provided valid reasons are given about why various abatement measures cannot be considered. It is generally most effective to provide full disclosure about the extent of the noise problem and manage peoples' expectations than to show a limited picture of the noise and fail to acknowledge the reality they experience every day.

Only when this inclusive approach includes the supplemental analysis described above can alternatives to shift noise exposure from one area to another be fully and fairly analyzed. Most alternatives to shift noise away from a sensitive area cannot be achieved without increasing exposure in some other sensitive area. The only way to reach consensus on shifting noise is to convince the population in the noise sensitive area facing the increase that by accepting a modest increase in the NA and TA at some moderate threshold levels, another noise sensitive area will receive a greater reduction in exposure in terms of NA and TA at the same or higher threshold levels. The increase or decrease in DNL from one sensitive area to the other may only be a fraction of a decibel, which alone is insufficient information for the affected population and study officials to make informed decisions.

A Promising Future

A number of recent noise studies have been or are being conducted using one or more, but not all of the inclusive approach elements described above, and to date, the public response has been very positive. Several major noise studies that are currently in the planning stages and are scheduled to commence in the late 2004 and 2005 timeframe will include most, if not all, of the inclusive approach elements. As these studies are completed and the results are assessed, we predict that more airport officials will adopt a more inclusive noise study approach, because they will be convinced this approach will result in less opposition to specific projects and to aviation growth in general. Consistently applied over time, this approach will also result in greater trust and vastly improved relations between airports and their surrounding communities.