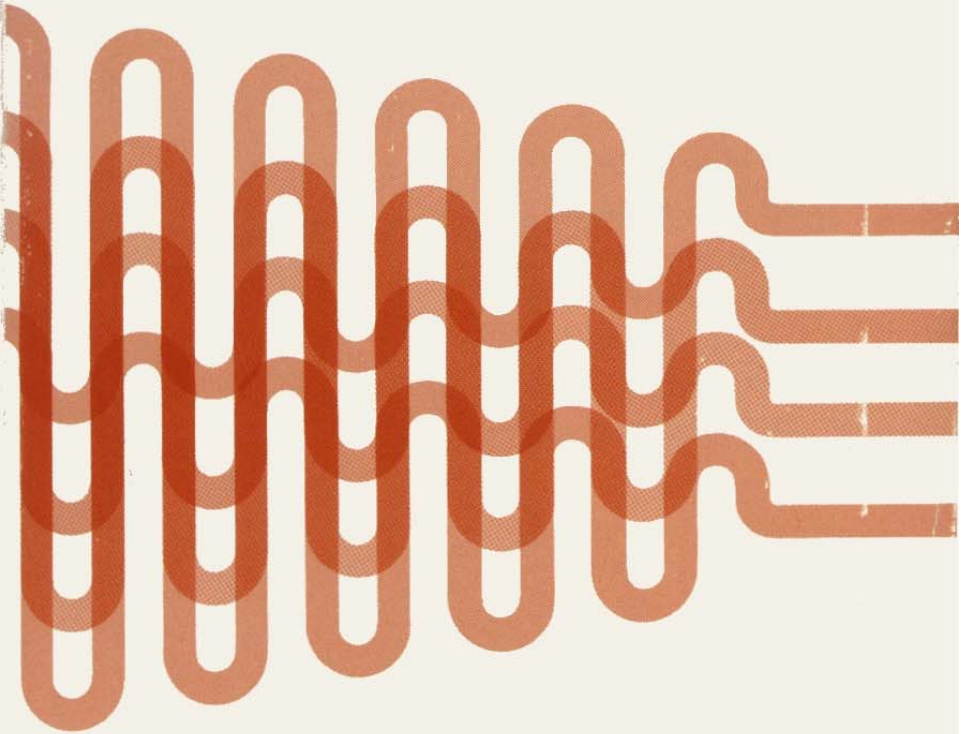


Department of Electrical and  
Computer Engineering  
University of Texas at Austin  
Austin, Texas  
15-17 October 1990

PROCEEDINGS OF

# NOISE-CON 90

REDUCING THE ANNOYANCE OF NOISE



*Edited by*  
**Ilene J. Busch-Vishniac**

## NOISE-CON 90

The University of Texas

Austin, Texas

October 15-17, 1990

### COMMUNITY ANNOYANCE WITH SPORTS CROWD NOISE A CASE STUDY OF THE FACTS IN A JURY DECISION

Jack B. Evans, P.E.

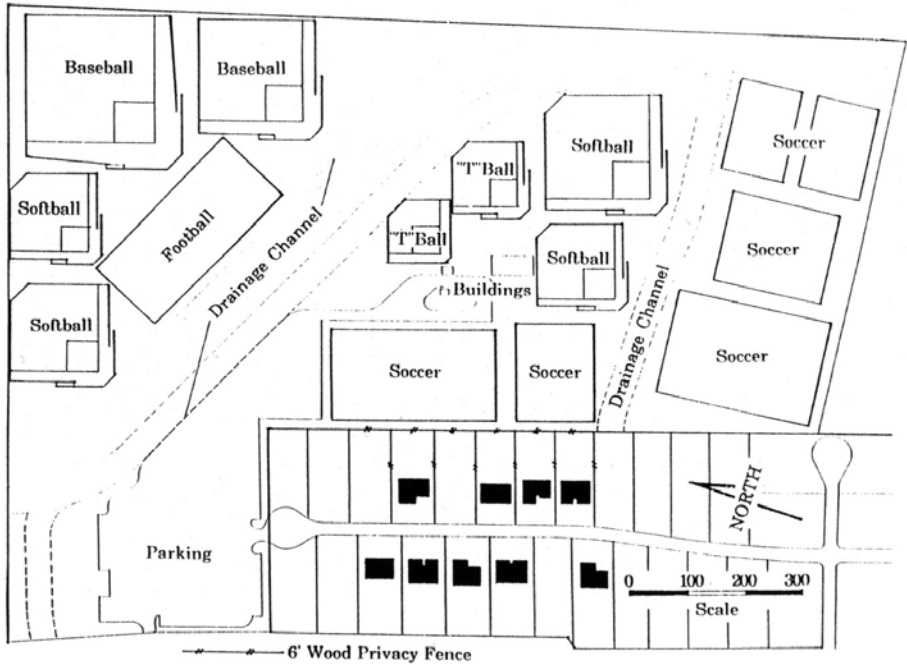
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*"A bad neighbor is a misfortune, as much as a good one is a great blessing."*  
Hesiod (c. 700 B.C.), Works and Days, line 346.

When does community noise annoyance become a nuisance? Crowd noise from a youth sports complex with annoying sound levels and qualities over a long duration has been shown to be a nuisance, and may lead to recovery of property "damages". This case study presents the issues and conditions that caused community noise annoyance and led ultimately to a Finding of Nuisance in court.

### HISTORY

A 35 acre sports complex for outdoor youth soccer, baseball and football was developed immediately adjacent to an existing suburban residential neighborhood. A common property line between the back yards of a dozen residential lots and the sports complex allowed two soccer fields to be located within 5-8 m (15'-25') of back yards. Beyond the soccer fields, to the north and northeast, four additional small soccer fields, eight softball, "T"-ball, and baseball fields, and one football field were developed (See layout of adjacent properties, below). No zoning restrictions or compatible land use ordinances affected the sports complex and residential neighborhood because they were outside the city limits. As a result of the sports complex development and use, the residents of the neighborhood faced a series of inconveniences and intrusions, including altered land drainage from re-graded sports fields, increased auto traffic in the neighborhood, parking along the street and in residents' driveways, young players ringing doorbells and entering yards to retrieve soccer balls kicked over fences, and the yelling, screaming and other loud



Layout of Sports Complex and Residential Neighborhood

exhortations of players' fans and families. Because of intensive use of the sports fields, which included regional and state tournaments, these intrusions occurred, from as early as 7 am to as late as 12 mn, any day of the week, although most tournaments were scheduled as two and three day weekend events.

The neighborhood residents joined together in a suit against the operators of the youth sports complex. Over a series of four years of various legal maneuvers, negotiations and compromises, the residential street was closed to sports complex traffic and parking, players were banned from retrieving lost balls from residents' yards, and the hours of some operations were restricted. The fan noise continued unabated however, causing severe annoyance to residents, who complained of interference with conversational speech, telephone use, radio/television enjoyment, and their loss of privacy and enjoyable use of their yards.

In January, 1990, the attorneys for the two parties agreed to retain a mediator specializing in alternative dispute resolution to avoid moving to trial. Additional compromise agreements were proposed, including further restrictions of hours of use — this time for all events, barring of night lighting and amplified sound (the capability existed, but had not yet been used), and the education of the users of the sports

fields by the operators to respect the property rights of adjacent residents.

Our acoustical consulting firm was retained to review the existing conditions with regards to potential noise mitigating concepts. On-site observations and ambient noise measurements indicated very little natural attenuation or attempts to mitigate noise, other than the small amount of attenuation provided by 2 m (6') privacy fences in the residents' back yards. The weekday morning ambient noise level was measured at 38-45 dBA with the sports complex unoccupied, allowing transient and intermittent noise sources to be easily perceived.

Conceptual noise control solutions developed included re-configuration of the sports fields to move fans farther from residential properties and to reorient voice sources away from the common property line, construction of back wall and partial roof covers of bleacher seating around baseball fields, erection of a 3-4 m (10'-14') noise barrier along the common property line and noise attenuating modifications to the residents' houses. After review of the noise attenuation proposals, the defendants (operators) determined that costs would be excessive, thus resulting in the mediation's collapse.

### TRIAL TESTIMONY AND JURY VERDICT

Nuisance has been legally defined by Texas case law precedence, in relation to property rights, as a condition causing "injury or inconvenience to a party in the use of his property ... which would be substantially offensive to persons of ordinary sensibilities..." *Columbian Carbon Co. v. Tholen*, No. 11815, Court of Civil Appeals of Texas, Galveston. Feb. 6, 1947.

In April, 1990, the case moved to trial. Noise measurements had been conducted in some of the Plaintiffs' back yards on a Saturday when only the soccer fields were in use by junior youth teams. Representative dBA levels, as recorded on tape and transcribed to

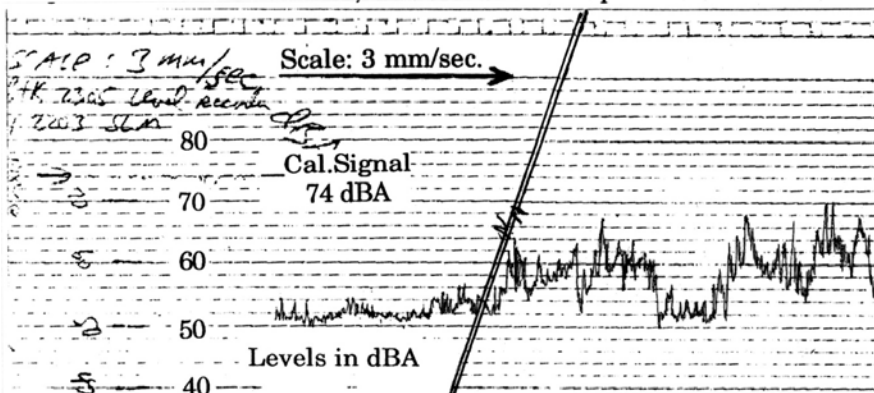


Chart Recording Excerpts: Levels and Variability of Noise

paper chart recording (see above), were presented in evidence. The chart recording showed low levels (between intermittent transients) about 50 dBA, which was approximately 10 dBA greater than the weekday ambient with no occupants and activities. Crowd noise (in the residents' yards) generally ranged between 50 and 60 dBA, with some transient peaks as great as 70(+) dBA. While these levels would normally be considered acceptable in an urban environment, they were very annoying to residents because of the sharp contrast with the low ambient noise of the suburban environment and the tonal, information carrying character of the (vocal) crowd noise.

Testimony was presented by Richard Boner of Boner Assoc., Inc. regarding the range of audible sound levels and frequencies as well as generally accepted subjective human perceptions of barely perceptible change (2-3 dB) and halving or doubling of sound level (10 dB)<sup>1</sup> to establish some acoustical basis for the jury. Additional testimony by Mr. Boner and myself established that:

- The sound level was variable, intermittent, transient and tonal in nature and carried identifiable information content. Broadband noise approximately 10 dB over ambient becomes objectionable, but narrow band or tonal noise much closer or even below ambient is perceptible and can be annoying.<sup>1</sup>
- Sound levels between 60 and 70 dBA were measured between 2 and 3 m (6'-10') to determine sound level at the residence wall without reflection from its wall, which exceeded the weekday ambient levels of 38-45 dBA by more than 20 dBA and Saturday ambient levels 45-50 dBA by at least 15 dBA.<sup>2</sup>
- Speech interference and distraction may occur with ambient sound levels between 60 and 70 dBA, when speaker and listener are separated by 5-7 m (15'-20'), as is very likely in the back yard of a residence. 75-80 dBA will interfere with speech at 1.5 m (5').<sup>3</sup>
- Continuous exposure to a varying and intermittent intrusive noise of 60 to 70 dBA, while not endangering health, can be annoying and cause stress.<sup>1, 2</sup>
- Use of music or other background sound to "mask" 60 to 70 dBA intrusive noise would not be effective, because the masking noise, at a similar level, would be unusual in the suburban environment, and therefore also annoying.<sup>1, 2</sup>
- The soccer field sidelines are within 4.5 m (15') of residential property lines. Measured sports activity sound levels on the residential properties already include distance losses from the fields to the yards.<sup>2</sup>
- Assuming up to 5 dBA (ideal: 6 dBA) of noise reduction per doubling of distance between source and receiver, to achieve 20

dBA of distance loss attenuation would require relocation of the soccer fields of over 45 m (150') from existing locations.<sup>4</sup>

- Interior levels in the houses might be 10-25 dBA lower than outside levels, using attenuation assumptions from HUD (U.S. Housing and Urban Development) guidelines for wood frame construction with open and closed windows, respectively.<sup>5</sup> (Previously recorded interior levels from another source validated these assumptions, but were not entered into evidence.)
- Erection of a 3.5 m (10') or greater sound barrier along the common property line could provide as much as 12-15 dBA of noise reduction in the back yards immediately behind the barrier, but due to distance between the barrier and the houses, typically about 17 m (60'), 8-10 dBA was the greatest attenuation that might be provided under ideal atmospheric conditions.<sup>5</sup>
- $L_{EQ}$  and  $L_{DN}$  were determined inadequate to express the tonal and intermittent qualities of the crowd noise, even though they are good descriptors of actual noise exposures for these reasons:
  - The residents of the homes adjacent to the sports fields showed a sensitivity to the crowd noise that exceeds what would normally be predicted from  $L_{EQ}$  and  $L_{DN}$  levels that had previously been correlated with broadband and relatively continuous community noise sources, such as traffic.
  - The crowd voice noise, with nearly instantaneous increase and decrease in volume, also has an almost startling effect unlike the gradual rise and fall in volume of intermittent environmental sources such as aircraft flyover or railroad traffic.

## CONCLUSION

Considering the facts presented above, along with the anecdotal testimonies of residents relative to their continuing annoyance and inconvenience due to loss of privacy of their homes, the jury found for the Plaintiffs, thereby extending the case law definition of nuisance to cover extended exposure of annoying intermittent and transient noise, which in this case was from non-amplified voice (crowd) noise sources.

At the time of this writing, the jury's decision has not been signed by the judge, due to a question over negligence. The decision for nuisance apparently is not questioned. Subsequent to review of negligence briefs, a hearing is anticipated to determine damages to residential property owners (Plaintiffs). It is possible that damages may include amounts to erect noise barriers and modify residences.

## REFERENCES

1. Testimony by Richard Boner, Northwest Woods Residents vs. The Optimist Club of Town and Country, et al., No. 466,613, 167 Judicial District Court, Travis Co., Texas, 1990.
2. Testimony by Jack B. Evans, Northwest Woods Residents vs. The Optimist Club of Town and Country, et al., No. 466,613, 167 Judicial District Court, Travis Co., Texas, 1990.
3. L.L. Beranek, ACOUSTICS, Part XXXI (American Institute of Physics for the Acoustical Society of America, New York, 1986) (reprint of text, originally published by McGraw Hill, 1954)
4. Laymon Miller, NOISE CONTROL FOR BUILDINGS AND MANUFACTURING PLANTS, Ch. 6 (Bolt Beranek and Newman, Cambridge, 1981)
5. "The Noise Guidebook," Ch. 4, U.S. Dept. of Housing and Urban Development, HUD-953-CPD (1985)
6. Sanford Fidell, "Speech Interference and Community Annoyance," COMMUNITY NOISE, ASTM STP 692, R. J. Peppin and C.W. Rodman, Eds., American Society for Testing and Materials, 1979, pp.80-86.

## ACKNOWLEDGEMENTS

We wish to thank David McCandless, AIA, of JEA for his assistance in development of environmental and architectural noise control solutions during the mediation stage of this case, and his illustration contribution for the paper.

We also wish to thank the Law Offices of Mark Perlmutter for permission to publish this case study and support assistance.

## Sports complex suit winds down

By Sharon Jayson  
American-Statesman Staff

An agreement to end almost four years of litigation over a 35-acre sports complex that neighbors blame for noise, vandalism and traffic problems is being drafted by lawyers.

The judgment should be final by the end of the month, said Russ Horton, attorney for Town and Country Optimist Club, which offers sports programs for 2,500 youngsters.

The legal battle began when residents of Northwest Woods subdivision sued owners of the 35-acre sports complex, charging negligence and nuisance.

## Optimists, neighbors near agreement that would end 4 years of litigation

for to end the case.

Although the agreement has not been signed, the parties have agreed that Optimists will forgive more than \$5,000 in court costs owed by the neighbors in exchange for the neighbors agreeing not to sue Optimists.

Mark Perlmutter, attorney for the plaintiffs, said Tuesday.

"We feel like we got a raw deal," said plaintiff Mary Barbera, who has lived in

the neighborhood 15 years and spent the last four complaining about the sports complex.

"Everybody has put their life savings into this and put in thousands and thousands of dollars," Barbera said. "We don't have the money to appeal. It's strictly financial."

She said plaintiffs were divided over the settlement offer but accepted it for financial reasons. Barbera and her husband Joe are among five couples who joined other neighbors as plaintiffs. They complained of noise, damage to property and traffic congestion created after the sports complex opened in 1986.

**See Neighbors, Back page**

## Neighbors, Optimists near agreement on 4-year-old suit

Continued from Page 1

1986 at the end of Meadowheath Drive. Because the tract is outside of Austin city limits, there was no opportunity for neighborhood response to the project before it was built.

"Their only recourse was the reasonableness of the Optimist Club, or failing that, the court system," Perlmutter said. "Because of the case, the Optimist Club has changed things in the way they do business and has made some effort to reduce the noise. But it's still not very liveable out there."

Among the plaintiff requests was that the court order the club wide greenbelt between the back yards and the playing fields, construction of a wooden fence, and regulations regarding the hours of play.

Although the court imposed no such requirements, Town and Country Optimist Club President

## Attorneys are drafting papers to end the litigation.

Jason Kastelic said his group continues to work for a peaceful coexistence.

"The Town and Country Optimist Club has continued to make improvements to address neighbor concerns," he said. "We've moved fields and lights, spending tens of thousands of dollars. We've planted over 50 trees along the property line to act as a buffer, and have thousands of dollars worth of trees throughout the complex."

The Sports Complex offers programs in baseball, basketball, football, soccer and softball and has several fields for those activities. The site includes a clubhouse with concession stand.

From The Austin American Statesman,  
"Neighbor: Northwest Austin,"  
Thursday, April 11, 1991, pp. 1, 8.