inter-noise 2002

The 2002 International Congress and Exposition on Noise Control Engineering
Dearborn, MI, USA. August 19-21, 2002

Transportation Noise and Recreational Lands

Nicholas P. Miller
Harris Miller Miller & Hanson Inc.
Burlington, Massachusetts 01803, USA

Abstract

An active and widely distributed transportation system is virtually a requirement for and a hallmark of countries that have a vigorous economy. As this conference demonstrates, one of the products of such a system is noise, and it is most certainly true that the prevalent type of noise experienced by the populations of these countries is the noise produced by transportation vehicles. A further result is that the sounds of transportation vehicles can be heard almost everywhere. The question addressed by this plenary lecture is: do these countries that value and use multiple types of transportation vehicles and systems also wish to preserve opportunities for their populations to experience natural outdoor environments that are essentially free of human produced sounds? The combination of technical complexities and political challenge may make such a preservation goal unachievable.

1. Introduction

The transportation system in the U.S. creates noise, and since the 1970's, analysis and mitigation of this noise where people live has become a routine part of the transportation planning process. This analysis generally focuses on specific projects for specific transportation modes. It is, in the author's experience, rare that a systems approach has been applied to examine multi-modal tradeoffs in transportation performance and environmental effects. The focused analyses aid in limiting the most significant effects of noise in the immediate vicinity of the source, and feasibility considerations always play a role in determining the area over which noise effects are examined and mitigated. The result is that there has been little or no real attention given by the acoustics community in the U.S. to the summed effects of all sources of noise over wide areas of the country.

This is not to say that there are not many professional individuals and organizations worldwide that are concerned with a broader perspective of the "soundscape". This broader perspective may address the quantifiable effects of all noise sources on people living in built environments (for example [1], [2], [3]), on developing a coordinated approach to use of noise indicators and assessment methods for examining environmental noise [4], on the qualitative values and effects

Hence, for each of the transportation sources, the comparison is between the maximum sound level of the source and the baseline of L_{dn} – 5 dB. The distance from the transportation track to the point where the maximum level equals L_{dn} – 5 dB is the distance of noticeability.

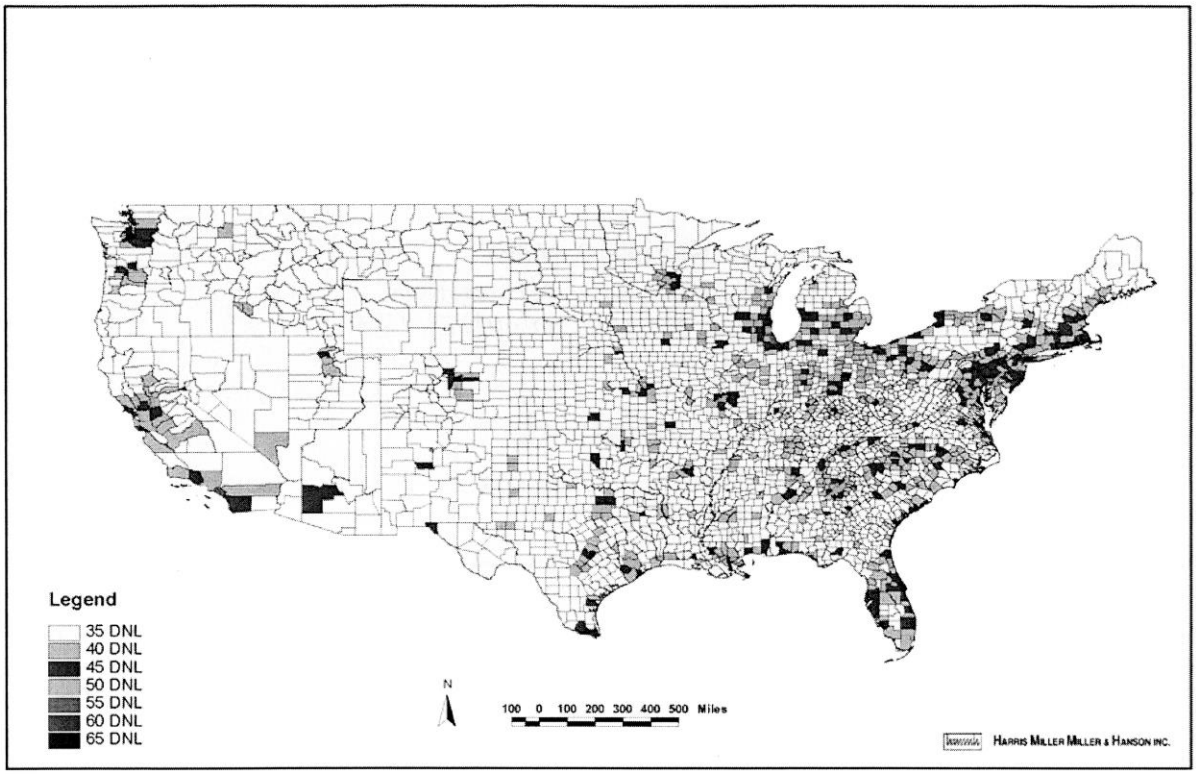

Figure 1 DNL by County, Developed from Population Density, Equation (1)

2.2 Highways

Figure 2 presents the results of the noticeability calculations for highway traffic noise. The specific divisions that depict the percent of county area where the noise is noticeable were chosen assuming that the greater the estimate of noticeable area, the higher the likelihood that the estimates are inaccurate. As the area of noticeability increases, the greater the probability that individual noticeability areas from different transportation segments will overlap. Hence, the divisions increase in size, as the percent increases.

The percent of a county in which noise is noticeable depends upon two variables: 1) the number of transportation corridor segments in the county, 2) the baseline sound level in the county. Thus, a county may have a low percentage of noticeable highway noise either because the baseline level is high or because there are few highways in the county.

2.3 Railways

Figure 3 presents the results of the noise influence calculations for railway noise.