Roadside Design to Reduce Traffic Noise: 1958-60

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This is the second supplemental report on abatement of highway noise with special reference to roadside design. It is a record of information as of January 1960, to supplement information already published in HRB Bul. 110 (1955), and in Roadside Development 1956 and 1959. This committee is interested in those factors that make for safe and pleasant driving as well as pleasant residential living along highways because highway landscape development is concerned with the complete development of the highway right-of-way and its environment. One of these factors is traffic noise which emanates from the highway to the surrounding area, affecting dwellers on abutting property.

A primary responsibility of highway engineers is that of providing transportation service to highway users. This responsibility has now broadened to include the effect of traffic noise not only on the motorist, but also on roadside dwellers. It is important that highway planners, locators, and designers analyze the economic effect of traffic noise upon abutting property users and values, and then do everything possible in the early planning and design stages of their work to suppress the noise which emanates from the highway to abutting property. This is especially important to all planning and design engineers concerned with the outpouring of traffic from the cities into the suburbs—and the profound social and economic problems that result from transportation change—particularly in communities in the vicinity of interchange areas where the greatest development will occur.

HRB Bul. 110 (1955) outlined (a) what may be done by the highway engineer to make traffic noise less objectionable to people living along the highway, and (b) what further research is needed for evaluating highway noise abatement methods.

The two supplemental reports of published information (1956-1958 and 1958-1960) on the problem of community noise should be helpful to those interested in the abatement of highway noise. Lists of the latest references are included.

The period 1958-1960 evidenced continued interest in transportation noise and an increasing interest on the part of a noise-conscious public trying to do something about the control of noise—a big problem in cities and in most communities. The highway engineer desiring to keep informed on trends in the field of outdoor noise will find this resume helpful on articles published since the last report was presented at the 38th Annual Meeting of the Highway Research Board, January 1959.

SUPPLEMENTAL REFERENCES
1958-1960

1. Martin, Harold H., "Our Urban Revolution." The Saturday Evening Post, 232: 27, p. 13-15, 74-79, Jan. 2, 1960. This is the first of three articles on what may be the major domestic problem, Megalopolis. The description of suburbia given on p. 78 is most timely.
2. Grutzmacher, Martin, "Traffic Noise Problems in Germany." Noise Control, 5:6, p. 7-12, 49, Nov. 1959. Article is a general survey of the technical approaches being taken to control the noise from vehicular traffic.
3. Beranek, Kryter, and Miller, "Reaction of People to Exterior Aircraft Noise." Noise Control, 5: 5 p. 23-31, 60, Sept. 1959. A summary and synthesis is given of results of authors' studies of this problem. Tables are given for computing perceived noise level (PNdb) from sound pressure levels. The PNdb rating method is compared with others. Influences of weather, time of day, and aircraft operations upon annoyance are shown. Extrapolations to new situations are discussed.
4. Rettinger, Michael, "Noise Level Reduction of 'Depressed' Freeways." Noise Control, 5: 4, p. 12-14, 54, July 1959. Author discusses the question of community noise and city planning: how much noise level reduction can be offered the nearby home owner, hospital, etc., when the freeway is "depressed" or constructed below the residential area elevation. Article shows how to calculate the reduction of noise at nearby residences, achieved by placement of highways in depressions.
5. Loye, Donald P., "Much Needed Motor Vehicle Noise Control." Noise Control, 5:4, p. 30-35, July 1959. Author summarizes existing laws specifying maximum noise levels, as measured with meters, and recommends a program for successful enforcement.
6. "The Noise Performance Standards of the Chicago Zoning Ordinance." Noise Control, 3: 6, p. 51-52, 74, Nov. 1957. This "comprehensive amendment" to the Chicago Zoning Ordinance, passed by the Chicago City Council on May 27, 1957, in particular the standards for noise and vibration, has re-

ceived considerable publicity in the seven years during which the various parts have been formulated. Its passage marked a major step forward in zoning ordinance requirements limiting noise and vibration. Although portions of these standards have been published previously, they are reprinted here in their entirety.

7. Oriard, Lewis L., "Report of Investigations: Noise Studies Connected With the Proposed Elevated Section of Freeway, Spokane, Washington." Consulting Geophysicist, Nov. 12, 1958. The main purpose of this investigation was to determine the existing noise levels at the Deaconess Hospital, Spokane, Washington, and the changes in noise levels that would be brought about by the construction of an elevated section of east-west freeway to the north of the hospital. The report includes six figures.
8. Simonson, Wilbur H., "Quiet Please." The American Road Builder, Aug. 1958, The American Road Builders Association, Washington, D. C.

Discussion

Ryan: Has any consideration been given to stopping traffic noise at its source?

Simonson: Considerable cooperative research has been done by automotive engineers to reduce the source of noise in motor vehicles, particularly heavy trucks. The design of mufflers has been improved to reduce exhaust noise. The possibilities of reducing other vehicle noises, gear howl, tire squeal, body rattles, special insulation in assembly of parts for quieter operation of vehicles, etc., are constantly being studied and improved in current designs. HRB Biblio. 22 (1958) contains a 10-page list of reference data on vehicle noise research.

As stated in HRB Bul. 110, the problem of automotive noise can be approached from several angles. First is the design and improvement of vehicles; that is, stopping traffic noise at its source. Second is the operation of vehicles. Truck routes can be made to bypass congested and residential areas by adequate planning. Third is the design of the highway itself, including building setback lines and zoning. As a committee, we are mainly interested in design methods of abating noise from highways as affecting the use of land bordering the highway.