

COMMITTEE ON THEORY OF PAVEMENT DESIGN

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This workshop was interesting and educational and provided an opportunity for a great deal of communication among interested parties in the pavement design field. It has also provided some perspective for the interaction of Highway Research Board committees interested in pavements. I will not belabor the general value of the workshop, inasmuch as that is covered elsewhere in this report. The fact that the workshop ultimately grew into discussions among members of the Committees on Theory of Pavement Design, Strength and Deformation Characteristics of Pavement Sections, and Mechanics of Earth Masses and Layered Systems is significant because the implication of the workshop should be to provide avenues of better communication and joint activities among these soils and design committees.

The teamwork involved in developing and putting on this workshop is illustrative of one of the major implications of the findings reported. Namely, a concerted team effort is needed to attack and solve successfully the complex problem of designing and managing pavement systems. If any agency or committee chooses to isolate itself from other agencies with related interests and interests involving other portions of the pavement system, it largely loses its effectiveness in performing its assigned or chosen tasks. Workshop Group C considered the overall design problem at some length and ultimately agreed on a conceptual model of the pavement design process as shown in Figure 3 of the paper by Hudson in this report. This was agreed to by the Committee on Theory of Pavement Design and, generally, other committees sponsoring the workshop.

Likewise, workshop Group I established unanimously that the pavement serviceability-performance concept typified by the AASHO Road Test PSI methods are at present the only known method of specifying and quantifying pavement performance and thus pavement failure. Certainly improvements are needed in any existing approach that uses this concept; however, the concept is basically valid. The other factor that was brought out at the workshop and that seems basic to pavement design is that a working pavement design system that incorporates as many of the parameters and factors into its models as possible is needed in order to provide at least a cursory basis for a sensitivity analysis comparing the effect of such parameters. Such a working system can more properly be called a pavement management system as suggested by several participants in the workshop, including Pister in his keynote address. No committee or section of the Highway Research Board is concerning itself with this important overall concept at the present time except perhaps the Committee on Theory of Pavement Design.

There was a strong overtone at this workshop of the importance of a mechanistically rational, theoretically based pavement structural subsystem, that is, one that uses proper materials characterization, proper formulation of boundary value problems, and proper solution of these problems to determine pavement behavior and proper distress analysis to determine limiting behavior or distress. However, it should be pointed out that the other two sponsoring committees are primarily concerned with this portion of the problem. The Committee on Strength and Deformation of Pavement Section is in fact concerned with realistic materials characterization as well as measurement of pavement behavioral characteristics. The Committee on Stress Analysis in Earth Masses is concerned primarily with the solution of boundary value problems and thus the theoretical prediction of stress, strain, and deflection.

Therefore, it seems obvious that the Committee on Theory of Pavement Design can best concern itself with the overall pavement management concept and with the

integration of interrelated factors and design subsystems to obtain a useful pavement management system.

It is vital that this coordination and leadership be provided, and no other committee within the Highway Research Board committee structure performs this function. Nor is it handled in the national highway pavement and materials research program or among the many agencies involved.