

SUMMARY OF SYMPOSIUM ON PAVEMENT DESIGN AND MANAGEMENT SYSTEMS

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During the 1974 meeting of the Transportation Research Board, a Symposium on Pavement Design and Management Systems was held. The symposium was sponsored by the Committee on Theory of Pavement Design and was chaired by William Gartner, Jr., who asked in his opening remarks, "Do you have the data needed to use the pavement management system?" It seems to me that the question should be, What factors really affect the performance of pavements? If a variable affects pavement performance, then it is essential that we obtain the necessary data to consider its effect in the design, construction, and maintenance of pavements. Even if we have to estimate the factor, we can still consider its effect on pavement performance and costs in some way.

A great deal of money is expended each year in pavement construction, maintenance, and research. The problems considered are not simple; neither are the answers.

Since the symposium, many new questions have been raised concerning pavement design and maintenance.

1. What effect will reduction in speed limits have on pavement maintenance? Can we accept a lower level of serviceability than we needed at a higher speed limit?
2. What effect on pavements will an increase in vehicle load have? (This has been proposed to increase fuel efficiency.)
3. What effect will increased asphalt costs have on pavement design, selection of materials, and overall pavement economy? (Costs have doubled or tripled within a 6-month period.)
4. In a staged-construction project for which there is no more money because of inflation, what will happen if the next surface increment is delayed by 1 year?

These questions cannot be answered by pavement design methods that involve only strength, thickness, and load. However, they can be treated by the pavement management systems outlined by speakers at the symposium. The 6 papers presented appear in this report and are briefly summarized in the following paragraphs.

Haas presents some terminology and general descriptions of systems analysis and pavement systems methodology. He points out that the pavement management system is a consistent methodology for considering design, planning, economics, construction, maintenance, rehabilitation, and salvage of a pavement.

Lewis reports on an operational pavement management system used by the Texas Highway Department. A flexible pavement management system is in use in 10 of the 25 Texas districts. Each district is semiautonomous and makes its own decisions on type of pavement methodology to be used. Lewis points out the importance of involving the user of the pavement management system in the development and implementation of the method. The use of the design method or management system in Texas grows each month.

Peterson reports on a pavement evaluation method that the Utah State Department of Highways uses for planning, programming, budgeting, and redesign of pavement systems. He outlines a broad measurements program that is used to evaluate pavements and to predict their remaining life. He also outlines the pavement management informa-

tion system that is being developed to handle data and analysis. These data include serviceability, skid resistance, surface condition, and deflection or structural condition.

Phang discusses the complexity of providing good pavements in Ontario. The number of steps, decisions, and people involved is large. He points out the need for a pavement data system and explains that their pavement design methodologies are being codified into a pavement management system.

That data are important is illustrated by the fact that many states already invest a great deal of energy and effort in data collection. For example, no highway department works without traffic and load information. They also have road inventory and life file cost files, and maintenance information. Data available from the weather bureau are also used. All that is necessary is to coordinate these data coherently into a pavement feedback or pavement management data system.

McMahon describes the improved structural analysis subsystem being developed by the Federal Highway Administration. He discusses some of the damage problems that are currently affecting pavements and describes the FHWA design check procedure. This procedure examines viscoelastic material parameters, if they are necessary.

Lytton reports on the implementation of the Systems Analysis Method for Pavement (SAMP) developed under the National Cooperative Highway Research Program. He discusses specifically the implementation of SAMP-6 and points out that it can be improved and upgraded. SAMP-5 was upgraded to SAMP-6, and subsequent improvements will perhaps result in SAMP-7, and so on.

Pavements are complex physical systems, but they are essential to transportation. This symposium showed that a rational methodology of systems analysis exists and can help to solve the pavement design and management problems.

The management system requires experience, knowledge, data, and most importantly, educated people. People have to develop it, provide the data for it, and finally use it. During the symposium, no one said that the computer designed the pavement. Far from it, the computer is a tool that only codifies and analyzes data. The pavement designer or the administrator makes the final decision. The pavement management system merely collects and codifies the information to provide the designer and the administrator with the most objective information possible for their use.