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Upper Midwest Chapter

On January 11, the Upper Midwest Chapter concluded its series of meetings on operations research in marketing. Paul Stillson of Paul Stillson and Company spoke before about 60 persons. This meeting, as well as our two subsequent meetings, was held at the Normandy Motor Hotel in Minneapolis.

Professor Gary Andrew of the University of Minnesota was the speaker on March 11. He talked on "Dynamic Programming." This meeting was sponsored jointly with the Twin Cities Chapter of The American Statistical Association.

The last two meetings of the season were concerned with recent advances in the use of computers. On April 13, Joseph Buchan of Touche, Ross, Bailey and Smart spoke on "The Use of Computers in Production Control."

Murray Richards of The Pillsbury Company and Gordon Davis of the University of Minnesota talked on "Computer Time-Sharing" on May 18. The evening included a time-sharing demonstration at The Pillsbury Company.

Reported by: Burnham S. Gould, Jr.

COLLEGE NEWS

Editor: Edward B. Roberts, School of Industrial Management, Massachusetts Institute of Technology, 50 Memorial Drive, Cambridge 39, Massachusetts.

College on Logistics Symposium on Transportation Decision Making

A three-day conference was sponsored by the College on Logistics of The Institute of Management Sciences and the Transportation Research Forum, in Washington, D.C., March 30-April 1, 1966. It represented the first major effort of the relatively young College. Its success—expressed in no small measure by the over two hundred registrants—will give the new College a good start.

The title of the conference represented a departure from the traditional topics of such conferences on transportation or logistics. Transportation decision-making is an area which does not readily fall into the framework of any one discipline in the traditional sense. Its discussion must therefore bridge several disciplines and professional areas, as illustrated by the areas emphasized during these three days. "Major Aspects of Transportation Decision Making" were followed on the second day with "Approaches to Total Transportation Studies," and on the third with "Major Technical Problems and Projects." In proceeding from broad policy problems through comprehensive study approaches to selected problems, the program was able to shed some light on the many facets of the decision-making process in transportation.

There were only two or at the most three speakers for each morning or afternoon session, and consequently there was ample time for presentation and discussion of each paper. In addition, morning and afternoon coffee breaks provided further opportunity for discussion and debate. The time made available for extensive discussion added greatly to the success of the conference.

Brief introductions were made by Professor Roy Herrmann, President of the College of Logistics, and by Edward Margolin, President of the Transportation Research Forum. The first day started with a paper on "Transportation for the Nation, An Overview of Government's Problems," presented by S. D. Sender, Staff Council of the Senate Commerce Committee. His talk focused on the need of government decision-makers for better factual information. He showed in one example how the lack of factual background information, which could have been obtained from a comprehensive analysis of the pertinent case in point, prevented the arguments from rising above the level of personal opinion and prejudice, and led to an unconvincing result. The paper demonstrated vividly the need for professional participation in support of transportation decision-making. The request for factual studies in support of decision-making is not under the control of the professional, but the communication of study results to non-professionals, including politicians, certainly is a responsibility which many professionals have all too often overlooked.

"Total Cost of Transportation, The Problem of Combining Economic and Social Valuations" was the second topic. Professor W. J. Baumol of Princeton University concentrated on the consideration of externalities in economic theory. In a colorful presentation, which kept the audience highly attentive, Professor Baumol defined externalities, and then showed how to handle them in some simplified models. Externalities do not include all social values, but since they are extremely important in transportation problems, the ability to treat them in a formal analysis is an important part of problem indicated in the topic of this paper.

Alan S. Boyd, Under Secretary of Commerce for Transportation, spoke about "Political Aspects of Transportation Decisions; The Political Executive's Method of Decision Making." He began his talk with a reminder that the political process is the democratic way to carry out the wishes of the people. He then stressed the difficulty of obtaining adequate background upon which to base decisions. The complex interaction between private and public portions of the various sectors of the transportation system show the complexity of the framework in which the government executive has to make decisions. The decision problem is technological, economic, and social, but social problems are only now beginning to become recognized, particularly in the fields of noise, pollution, and safety. In conclusion, Secretary Boyd stresses again the need for factual background upon which to build decisions, but he also stressed the necessity for the politician to remain responsive to the public.

The last talk of the day, on "Resource Allocation Decisions; Government's Criteria for Spending of Transportation," was given by Charles Zwick, Assistant Director, the Bureau of the Budget. Dr. Zwick pointed out that the govern-

ment uses basically the same criteria as industry in making resource allocations; i.e., maximum results for minimum costs. The government is concerned with a wide diversity of transportation problems, ranging from research and demonstration expenditures such as for the Supersonic Transport Airplane, to the provision of transportation facilities such as highways and airports, to the operation of entire transportation enterprises such as the Alaska Railroad, the Panama Canal, and air traffic control, to the provision of subsidies, such as to the Merchant Marines and local airlines. For each of these four areas, the government must apply different criteria to decide on the level of support. The criteria need more thought and study to provide a better basis for resource allocations.

At the banquet, Najeeb E. Halaby, Senior Vice President of American World Airways and former administrator of the Federal Aviation Agency pre-present transportation system, Mr. Halaby demonstrated what could be done. He used as an example the movement of a person in intercity trips today and tomorrow. To bring about his futuristic trip, Mr. Halaby suggested that the new Department of Transportation carry out studies for such new transport systems. Maybe some of these studies could be supported by the fifty million dollar research budget of the FAA, although Mr. Halaby did not suggest that.

The second day was devoted to reviews of overall transportation studies. Robert A. Nelson, Director of the Office of High-Speed Ground Transportation of the Department of Commerce, talked about the "Northeast Corridor Transportation Study." He first described the framework of the high-speed ground transportation program, which contains the Northeast Corridor Project, together with a research and development program, a demonstration of rail passenger service and a transportation information system. The Corridor Project consists of five main tasks; the estimation of demand, the description of alternative systems, the determination of interaction between the system combination and the Corridor community, an exploration of possible organizations and financing, and an evaluation of alternatives with an accounting of consequences of various alternative solutions. At the present time the project is scheduled for completion in 1967, although some phases of the overall study are still in their early stages. The large number of questions at the end of this talk indicated the audience's high level of interest in the topic. The problem is so complex that large portions are not and cannot be adequately represented in this first comprehensive study.

Professor Wilhelm Leutzbach, of the Technical University of Karlsruhe in Germany, presented an overview of the "Northrhein-Westphalia Study," which is carried out for that state, which includes the Ruhr Valley industrial center, in Germany. This study, which has been underway for several years, consists of inventory, analysis, and forecast for all transportation for this industrialized state. Extensive data collections on transportation facilities and transportation movements have been carried out on all modes of transportation and are now being evaluated. This study will lead first to short-range transportation plans to provide immediate improvements in the existing transportation systems. A long-range development plan of an integrated transportation system evolving from the existing facilities is also to be worked out. In addition to this, several

theoretical studies, such as optimization of network flow and methods of systems analysis are also being developed. The study staff is made up almost entirely of consultants, most of whom work independently under an overall design framework. The approach of this study as compared to our American studies is characterized by a more tightly planned data collection and initial study phase. The somewhat different theoretical approaches and concepts make it desirable to exchange ideas on a much more formal and frequent basis than has been done in the past.

William Bender, of North American Aviation, talked about the "California Transportation Research Program," giving an outline of the \$100,000 six-month pilot study carried out by his organization for the state of California. His talk was organized around a series of slides outlining their development of potential future transportation systems. One conclusion of the study was that a comprehensive study should be undertaken. Mr. Bender said that he had learned that a comprehensive transportation study is more difficult than getting a man to the moon.

The last paper of the day, by Edwin T. Haefele of the Brookings Institution, was concerned with "Transportation Planning: A Process in Search of a Policy." This paper was probably the most thought-provoking contribution to the conference, dealing with the unfortunate truth that we know how to do transport planning but don't know what to do with its results. The problem is still growing, and Mr. Haefele developed his thesis that social and political valuations and decisions must be separated from economic and technical analysis and valuations. This paper heralds the beginning of a new look at transportation as a much more complex and interwoven phenomenon in our social and economic structure than even our most comprehensive current techno-economic analyses recognize.

The last day of the conference was devoted to major technical problems and projects and was intended to pick out some of the noteworthy slices of the complex pie of transportation projects and studies. The topics represent a diverse mixture and so did the presentations.

Peter Fielding, of the Booz-Allen Applied Research Corporation, presented a paper on the "Analysis of the Functions of Transportation—Individual Transportation Study," which his company is carrying out under contract for the Bureau of Public Roads. The work is built upon successful systems analysis in military applications, and develops the rationale for this study. The ultimate objective of the study is to provide the decision-makers with the capability to perform such tasks as the analysis of the effects of certain policy decisions, the evaluation of alternative modes of transportation, the specification of critical areas for research, the evaluation of relative benefits of certain systems, and an engineering analysis of specific systems and their components. The presentation showed a rather intricate mathematical model with detailed submodels, far too complex to be comprehensible in the available time. It was stated that several examples demonstrated the workability of the model. The presentation seemed to leave a rather universal confusion about the purpose, workability, approach and logic of the model.

Professor R. Soberman, of the University of Toronto, talked about "Cost of Technological Difference Among Modes" and showed several research examples of cost studies of certain alternative policies within and among modes and their effects upon engineering decisions. Building upon these relatively simple cost data, transport link performance vectors were constructed in which cost and time importance and other potential variables are represented for possible mathematical comparison of alternative transportation choices. This microanalysis, with real data, demonstrated the difficulty of developing any significant large-scale model and showed the tremendous potential for research in this area.

The paper on "SST vs. Jet" was given by A. Katz, formerly head of the Supersonic Transport Project of the Department of Commerce. His talk outlined the analysis of the economic feasibility of developing a supersonic transport for the United States in competition with the Anglo-French Concorde. The study actually compared five aircraft over a potential international route network with assumed demands. The analysis provided cash flow forecasts for government, manufacturers and airlines. This study, too, demonstrated how much effort even a relatively small analysis required. But it also indicated how much one can learn from a well-done analysis such as this one.

"Terminal Movement Simulation" was presented by A. M. Feiler, Program Manager of Project TRANSIM at UCLA. His simulation program dealt with freight movements through a port city with its various modes of transportation and their interfaces. The program is a simulation of individual movements as observed and defined from actual operations in the field. It seems to be a powerful simulation tool which should be of considerable interest to research and operating people, and provide a good basis for more complex model developments.

The discussions of "Railroad Simulation" by William M. Wendt, formerly with the Southern Railway, outlined some railroad simulation models. The train performance calculator is a computerization of some of the well-known computations for train performance. Other models are the single track capacity analyzer, the yard simulation, and the motive power distribution model. Some of these models were developed by the Canadian National Railroads, others by the Batelle Memorial Institute. Some railroads are now developing more sophisticated network and other simulation models.

In conclusion, the most overwhelming impression left by the conference was the need for better communication between the professional and the decision-maker. It is only appropriate to stress that the professionals in the many disciplines related to transportation have a grave responsibility, which they seem to have neglected in the past, namely to communicate their work in clear and understandable form, not only to other researchers working in the transportation area, but particularly to the public and to the political decision-makers. It was clearly indicated that the public and the politician are ready to accept and use such information as input to better decision-making.

Reported by: S. M. Breuning, Professor of Civil Engineering, Massachusetts Institute of Technology