

ticians, and other pertinent disciplines. It probably also ought to have, as a member of the team, someone who is cognizant of Highway Research Board problems internally, and perhaps someone cognizant of the political impact of the kinds of things that might result.

But one cannot escape the feeling that some of the very tools described (linear programming, matrix algebra, operation gaming, Monte Carlo processes), coupled with the facilities of high-speed computers, could bring results beyond those obtained by groups of people studying problems like this within highway departments. The university is uniquely a desirable place in which to center such studies, because of the wealth of diverse resources available, either on a direct participation basis or a consulting basis.

It is gratifying to hear that some operations research is being done in this area and it is hoped that this technique can make some contribution toward the solution of this immensely complex problem.

Community Planning and Highway Improvement Must be Joined at the Local Level

Joseph L. Intermaggio, Highway Research Board

The Highway Research Board Committee on Urban Research is interested broadly in the areas that have been particularized here, especially in the interrelationships of community development and transportation systems.

Several of the preceding participants have spoken of the national highway program, with some very broad objectives requiring a national viewpoint. We have gone a long way in setting forth a national highway development policy. But we have not gone as far in articulating another essential—a national development policy which this national highway program can help to achieve. This is something which must be spelled out on local levels.

If community planners do not indicate what the range of local alternatives is, and what the land use plans are, or what they should be, there is not going to be very much chance to develop an effective highway program for the local areas.

Neither can one measure the effectiveness nationally nor achieve the optimum results in a national highway program unless these broad objectives are spelled out within the range of a great number of alternatives, taking into account the dynamics of population growth, changing technology, and other factors.

With respect to population growth, New York City provides an excellent illustration. New York's anticipated regional growth has been estimated at about four or five million people in the next 25 years. This would amount to wrapping Los Angeles around the New York metropolitan area.

In such a situation, the measurement of economic impact is a difficult thing. Nevertheless, determination of an objective may make it far easier to achieve these goals and to institute directive devices as the local economy is developed.

There have been many evidences at this conference of the great amount of study and work that has been done, and that there is a need for educational dissemination of the ideas that have been expressed here. There is no question but that the uncovering of these ideas can have far-reaching

effects. This is said in the full knowledge of the kind of problems arising in the Washington metropolitan area, requiring decisions with respect to highways and bridges that will affect the values in the growing outlying communities, as well as the values in the older downtown communities.

To determine public policy on the basis of the information now available may actually involve a total transportation cost in excess of what should be undertaken. These decisions cannot be made unless the available knowledge is refined and applied to operating practices which take broadly into account the effects that these decisions will have on the communities.

Discussion on Special Problems

Bypasses, Traffic Interrelationships, General Economic Orientation

BYPASSES

The discussion on the economic impact of bypasses brought out the need for establishment of control of access if the bypass is to continue to accomplish its basic function of facilitating traffic. It was brought out that business in general, in the central business areas, was not impaired although some specific types of business were. Mr. Michael suggested that the closer the bypass was located to an urban area, the more rapid would be the development of abutting and nearby land.

Mr. Carroll asked what would happen if a study indicated that business had suffered as a result of a bypass. He thought that the studies should help find an optimum location rather than prove a particular location good or bad. Mr. Straub felt that better criteria for location might be determined by comparing the findings of studies of a number of various types of highway improvements. He indicated that, once the methodology has been worked out, Virginia hopes to make a dozen studies during the coming year. Mr. Waters pointed out some difficulties in obtaining uniform reporting of data.

TRAFFIC INTERRELATIONSHIPS

Mr. Wetmore stated that origin-destination studies had been handicapped by inadequate land use materials to permit analysis of the economic structure of the city. He believed that census tracting conforming to land use would help increase the usefulness of O-D studies and emphasized the desirability of studying the impact of different types of bypasses on the economic development of cities of various sizes. Expressways themselves can be regarded as a type of bypass to certain areas.

Mr. Richards described the depressed express highways of Detroit as bypasses that go through the city. He stressed the impressive economic savings involved in decreased accident rates on Detroit expressways. He also endorsed the idea of preparing a bibliography on completed economic impact studies for distribution to the states and cities.

Mr. Michael pointed out the advantage of the bypass to Kokomo, Ind. Although it did not solve the traffic problem on the old route, the local people had better access to downtown stores and through traffic has benefited by being routed away from this congested area. He added that their origin-destination study had included and analyzed data on purpose of trip and stops, and the effect of the bypass on local shopping.

Mr. Sharpe also noted the potential value of origin-destination