

All of this work that I have discussed has been carried on under the direction of C. J. Keese with Dr. T. J. Hirsch, Dr. R. M. Olson, and Dr. N. J. Rowan as the principal investigators. Professors Keese, Hirsch, and Rowan will discuss these programs in detail when I conclude.

One matter which we would like to bring to the attention of the committee with regard to highway research in general is the tendency developing over the past 2 years to ask research organizations to perform large dollar research programs in short-time intervals. We seriously doubt the wisdom of this approach since it has been our experience crash programs are wasteful in time and money and often unrewarding in useful results. Most effective research rests on "trial and error" procedures and it is difficult to speed such processes up.

We have one of the larger research organizations in universities in this country and, frankly, several of the projects which we have been asked to quote on recently we do not have the staff to do.

It is now my pleasure to turn the microphone over to Prof. C. J. Keese, who with his colleagues, will provide a more detailed report of our highway safety research in the areas of breakaway signs, breakaway lighting standards, new concepts for highway lighting, and impact attenuation systems. But before I do, I would like to state in summary that it is our opinion that the two principles involved in reducing the number and severity of accidents involving collision with roadside obstructions are these:

First, limitation of the number of fixed objects in the right-of-way to the minimum. I think this should be from right-of-way line to right-of-way line;

Second, provide protection for the driver of the vehicle at those fixed objects that are necessary.

Thank you, Mr. Chairman.

Mr. BLATNIK. Thank you, Dean Benson. Professor Keese, would you proceed?

Dr. KEESE. Mr. Chairman, since about 1956, the Texas Transportation Institute has conducted and reported or now has underway some 29 major studies in the field of traffic and highway safety. These have been in the general areas of traffic accidents, including the breakaway sign and attenuation studies, illumination or highway lighting including the breakaway light poles, channelization and delineation, signing, speeds, freeway design operation and safety, general highway design operation and safety including city street medians.

A partial list of these studies furnished to the staff of the subcommittee will be available to you.

Gentlemen, probably because of the results of our cooperative research program with the Texas Highway Department, the institute has a long-established philosophy that research has little or no inventory value, that it should be put to work as rapidly as possible if we are going to catch up with the demands of transportation today.

We have a philosophy throughout most of our research programs which is based on developing a theory, evaluating that theory through experimentation, and further evaluating it through practical application.

This brings together on each project an advisory committee composed of highly qualified engineers and others from the sponsoring