

Dr. HIRSCH. Thank you, Mr. Keese. I will speak principally on the breakaway sign and the research that we have done in this area. To start first, we need a little feel of why this problem of rigid sign supports only came to our attention in recent years. We started our first research in this area in September 1963. I think to give you a little background on our modern freeway and Interstate Highway Systems, they are multilane and the speed limit has been increased up to about 70 miles an hour, and that a vehicle operator traveling on these modern facilities at legal speeds now must make more decisions as to changing lanes, what entrance ramp to select, what exit ramp, and so forth. Consequently, the number of these roadside signs has increased.

Also, with the higher speeds, 60 and 70 miles an hour, the size of the signs required has increased in recent years—they are up to very large size, on the order of 8 feet by 16 feet—the messages are larger; larger letters are used so the operator can see it farther down the road and have sufficient response time so that he can make a decision as to what to do.

Consequently, due to this increased size of the sign background these signs are designed by structural engineers. And this refers to the division of responsibility between the geometric designer and structural designer—there is a need to design and hold these signs up with the wind loads on the larger backgrounds. Larger structural supports have resulted, similar to the sample on the table here, where we have 8-inch wide flange beams weighing 20 to 35 pounds per foot. On some of these large signs, the size of these beams is 10 inches, and more.

Because of this, in about 1963, engineers with the Texas Highway Department and the Texas Transportation Institute realized that we had a lethal obstacle in the roadway. In some cases these were as close as 2 feet to the roadway.

We looked into the statistics and found that in Texas alone in 1963, there were 867 vehicular accidents with roadside signs. These accidents resulted in 264 injuries and 15 fatalities.

In 1964, 1 year later, these figures in essence have doubled. There were 1,201 accidents, 400 injuries and 31 fatalities.

Mr. W. MAY. These are sign accidents?

Dr. HIRSCH. These are sign accidents in the State of Texas.

I am sure we do not have the figures for 1965 and 1966, but the numbers have increased, not only in the State of Texas, but in the Nation.

In September 1963, we started on this cooperative project with the Texas Highway Department and the Bureau of Public Roads. On this project the research engineers were working with highway engineers, and one principally, Leon Hawkins, who was in charge of designing structural supports, and we started out with this approach that Mr. Keese mentioned. We were in a hurry and we more or less followed a cut and dried procedure.

We had a hypothesis when we started. We realized the severity of impact to signs was due to probably three things: the massive posts, the stiffness of the posts, and the fixity of the base of the post to a rigid concrete foundation.

As the research proceeded, it turned out that probably the most significant factor here rather than size or stiffness of the post was the