Mr. SKEELS. The location that we see on these light poles being so close to the road is probably the result of the fact lighting is specified by the lighting engineer, and his primary purpose is to light the road. This is his job. And he specifies a distance that is dictated by lighting requirements and not by safety requirements.

I have talked to some of these people and they recognize that they are putting a hazard there but they do not put much weight on the seriousness of the hazard.

Data we have gathered at the General Motors proving ground indicates 47 percent of the cars that leave the travel surface go more than 12 feet from the edge of the travel surface; 18 percent of them go more than 30 feet from the travel surface. At the proving ground we do put our lights 30 feet from the travel surface. And we do not use them on high-speed roads. We have never had one hit.

I would think that 20 to 30 feet would be a very reasonable thing.

The lighting engineer is going to take some loss in efficiency of lighting. I do not think he can do as good a job with a light pole this far from the road as he can up where he would like to have it. But we may have to take a tradeoff of lighting efficiency versus safety.

Mr. CONSTANDY. It might inspire them to do research in that area and perhaps come up with one that would be as effective.

Mr. SKEELS. I think maybe they already have. As has been indicated, there have been big advances in this field recently and at the proving ground we just arbitrarily told them how far away they had to keep the lights from the paved surface and they should do the best they could with this ground rule.

In any case, regardless of how far it is from the surface, if it is in the position where it can conceivably be hit, it must have a slip or a frangible base. This is primary and all light poles should be designed with this in mind.

I might point out there is an NCHRP project in the final process of being let—this is administered by the highway research board; it is initiated by AASHO—to look into the best way of accomplishing this or the best ways of accomplishing or of making light poles safe.

Texas uses the frangible base insert. Some States are using an aluminum transformer base which is frangible. And we are using a slip base which was developed from the Texas A. & M. signpost approach.

We have done testing work for the State of Michigan in applying the slip bases to steel posts. It appears to us that the slip base is slightly more effective than the frangible base, but either one of them will save lives. I am not implying the slip base will save more lives than frangible base, but it will do less damage to the vehicle and possibly to the occupants. Either approach appears satisfactory.

Again, all light poles should have one or the other.

Mr. CONSTANDY. Thank you.

Mr. Huff, would you care to add to the remarks you made before?

Mr. HUFF. I would like to correct the record a bit.

Texas uses the frangible transformer base on all new construction and has for some 5 or 6 years. Prior to that we had about 4,000 installations with a steel base. That is the rigid base made of steel. We are adapting the insert to correct that condition.

I would also like to dwell just a moment upon and expand on new ideas Mr. Skeels mentioned. We are working in our Texas Transporta-