

about being there and which do present real hazards and were called to our attention, then perhaps other problems would have been created. I would say, due to our ability and good engineering judgment in the Department of Public Works, as of this date of this final research report we have let to contract over 740 miles of newly designed barriers.

This has been accomplished prior to the date of a final summary of all the research aspects. Further, we have issued orders to make remedial improvements on all current projects to the maximum extent possible. Further, we have an active program of bridge rail and guardrail replacement.

We believe that we are making some real progress. As for communication between States, I might add for Mr. Beaton's sake that in the middle of our research, we adopted California's median blocked-out barrier in 1962 based on the results of California's experience, as an interim before we moved into our new designs.

Mr. BLATNIK. The Chair on behalf of the entire committee thanks Mr. McAlpin and Mr. Graham, for their excellent and most helpful testimony and presentation. Thank you very much, gentlemen.

This concludes the hearing for this phase of the committee work. I have a short closing statement.

There is one thing that has been clearly established by the testimony we have heard this week, and that is the vital importance of having clear roadsides along our traveled highways.

We have seen demonstrated again and again what happens to the vehicle that hurtles off the road and smashes against some massive, rigid fixed object—which hindsight then often shows should not have been there in the first place.

It is not reasonable to suppose, of course, that our roadsides can ever be made 100 percent free of fixed objects. However, we have learned that many of these pieces of highway hardware that are absolutely necessary can be of a "breakaway" type that readily give way when hit, causing only slight damage to the car, and leaving its occupants uninjured. The difference between this result and what happens when a car hits signs or other objects held by solid, heavy-duty, steel I-beams or pipes mounted upon reinforced concrete bases, is a dramatic one indeed.

If the necessary roadside object cannot be of breakaway construction, then it should be adequately protected by proper guardrail or other impact attenuation devices which will prevent or minimize the damage.

The availability of breakaway and impact absorbing devices has been well illustrated by the testimony we have heard this week from people in the field of research and development. We have watched pictures of speeding cars crashing against sign supports with no serious damage resulting because the objects struck were not anchored in concrete, but readily "gave" or "spun" out of the way when hit. We have seen and heard about whole new concepts in the field of highway design and safety from these experienced and knowledgeable witnesses who so badly need to be listened to and heeded by those in authority.

Some of the more important concepts in the field of safe highway design are not new. The desirability of reasonably clear roadsides and gore areas, for instance, has been known and repeatedly demonstrated