

rosion that might exist. As you indicated, you see no reason why, whatsoever.

Dr. KEESE. No, sir.

Mr. BLATNIK. Mr. May.

Mr. MAY. Mr. Chairman, we have here a list of research projects presently in progress at the institute and we will make this exhibit No. 16.

Mr. BLATNIK. Without objection, so ordered.

(Exhibit No. 16 is retained in subcommittee files.)

Dr. KEESE. Mr. Chairman, we have one other matter that we had planned to discuss very briefly, and this is a matter of attenuation devices. We have conducted a feasibility study on these attenuation devices.

Mr. MAY. Mr. Keese, will you proceed to describe that?

Dr. KEESE. I will ask Dr. Hirsch to describe that briefly, if he will.

Dr. HIRSCH. The area I want to cover is impact attenuation or energy absorbing barriers which can be placed around fixed obstacles.

Mr. BLATNIK. Just for the record, Doctor, and also for our benefit, what is a more precise definition of the word "attenuation"?

Dr. HIRSCH. Attenuation is an attempt to stop a speeding vehicle out of control, before it hits a rigid obstacle, and bring him to a controlled stop with controlled deceleration or gravity forces below the level which would result in injury or death or fatalities.

Mr. BLATNIK. That is important. Controlled deceleration, rather than the secondary point of impact?

Dr. HIRSCH. Right. That is right.

Mr. BLATNIK. They may have a wooden support or something frangible so a lesser impact might not cause as much damage as the more severe point of impact, such as rigid steel supports embedded in concrete?

Dr. HIRSCH. That is right. That is correct.

Mr. MAY. Are you going to use visual aids, Doctor?

Dr. HIRSCH. I have a few slides. Just to introduce this problem, though, we have talked about the breakaway sign concept and the breakaway light pole. There are other obstacles in the roadway such as bridge piers which are in the median, wing walls, bridge abutments, supports of large overhead sign bridges, utility poles of various types which still present a problem which at the present time we cannot solve with the breakaway concept.

Some guardrail installations have been installed to protect these obstacles. In general, we feel that guardrails as presently designed and installed are not impact attenuators. They have the primary function of restraining the vehicle from leaving the roadway and to redirect it.

We conducted a feasibility study on the possibility of bringing these out-of-control vehicles to a controlled stop. In certain of these rigid obstacles, guardrail installations are placed around them, guardrails required to be 50, 75, or 100 feet long which in effect is enlarging the target and the probability that the vehicle will have an accident with the guardrail, probably much more frequently than if the guardrail had not been there at all, so in this line we have been looking at impact attenuation devices.