

The shoulder itself may require some kind of black treatment.

I think it is important, in my own opinion, that shoulders should be paved. If you look at the skidding-type accidents the skids start on the travelway many times and are carried right off in the shoulder area.

Whenever you get into a soft material, there is always a chance that the vehicle may overturn by getting caught in the soft material.

I think we have paved our shoulders, and particularly the right-hand shoulders, in California for as long as I can remember. We have recently decided to pave our inside shoulders from a 2-foot width to a full 5-foot width on our freeways.

This will result in a slightly higher cost initially, but will certainly reduce maintenance overall.

Mr. CONSTANDY. Thank you, Mr. Wilson. Mr. Skeels?

Mr. SKEELS. Not being an expert in this area, I will make one point. It was not shown in Mr. Prisk's slides. This is the problem of the shoulder on the cloverleaf ramp.

Many of these cloverleaf ramps for various reasons are in restricted areas and have fairly short radius turns; and my observation is that the shoulders are paved on the inside and sometimes the outside of these turns, and that is where the traffic rides.

I wonder if there is a better solution to this?

The only one I know of is to eliminate the short radius turns, and this is not always practical.

Mr. CONSTANDY. Thank you, Mr. Skeels. Mr. Huff?

Mr. HUFF. I believe there is no need to comment on what Mr. Prisk said. I was more impressed by what he did not say than I was by what he did say.

He did not discuss the adequacy of the width of the shoulder as related to the needs of traffic. Nor did he dwell very much on the turbulence created when a shoulder has to funnel into a narrow bridge. Emphasis in discussion of shoulders should be put upon the question: How wide should a shoulder be on the road and how wide should it be on the bridge as related to the road?

In my opinion the bridge shoulders must be 2 to 4 feet wider than the road shoulder, and it is my personal opinion that road shoulders should be at least 12 feet wide instead of 10 as is now provided for in the standards.

Mr. CONSTANDY. Would you suggest that on both sides, Mr. Huff?

Mr. HUFF. Definitely on both sides. Originally the shoulder on the right side was provided for cars that got out of control and had to go over and stop. The shoulder on the left side was an obstruction clearance only. With increased speed of automobiles and increased number of automobiles, it is my opinion that the clearance—the obstruction clearance for the rail should be wide enough to provide for a stopped vehicle as well as for clearance.

Mr. CONSTANDY. Thank you, Mr. Huff. Mr. Prisk?

Mr. PRISK. I would like to say that I am impressed by what Mr. Huff says about the provisions for shoulder width. I think this is very definitely a move toward safer design, particularly on structures. And I would fully concur in the comments that he has made.

Mr. CONSTANDY. Thank you. I would like to say that Mr. Prisk's omission of those is probably my fault brought about by an effort to try to hurry this along so we can conclude it today. Mr. Wilkes?