Heights of guardrail measured varied from 22 inches to more than 30 inches, sometimes as much as this within a given State. A growing appreciation of the value of 6'3" post spacing is spreading in all States visited and in their newest work at least, the closer spacing is being used to strengthen guardrail sections. In only three States, Missouri, Montana and Utah, were guardrail installations regularly found to have washers on the bolt heads to prevent their pulling through the rail in the event of collision. These simple, inexpensive washers, along with the stiffening sections used at intermediate posts, will greatly strengthen beam guardrail installations.

Blocking out of the guardrail is found to be a standard practice in only a few of the States. On projects in Georgia and Utah, it was found that guardrail was blocked out only at the sign installations. Other sections had no blocks. On one project in Montana, the median barrier post had actually been notched so as to obtain the minimum standard lateral clearance between the face of the rail and the edge of the pavement.

Guardrail ends can be extremely hazardous to cars running off the road and should be buried in the ground at their approach end. They were treated this way in three of the nine States visited. In other cases, rail was either flared back or installed parallel with the roadway alignment and not buried.

Signs

Wherever permanent signs were installed in the gore areas of the nine Interstate projects, they were, without exception, unreasonably heavy or massive. Mounting supports for the standard 5' x 6' EXIT sign varied all the way from a three-inch steel post for a temporary installation to two steel I-beams six inches in depth. Other sign supports ranged up to multiple twelve-inch I-beams for the larger advance guide signs. The desirable breakaway feature which has been urged on the State highway departments by the Bureau of Public Roads for sign installations, was found on only one of the nine projects and in this case, only on relatively minor type signs.

Curbs

Barrier curb was used without clear justification at many locations. Frequently it was placed in front of a guard rail or a barrier rail where it could adversely affect the proper performance of the rail structure. Curb is used often for delineation purposes to outline gore areas and other locations where there is sometimes no functional need to control drainage. A highly commendable design noted on the Utah Interstate project in Salt Lake City was characterized by a curb located about two feet behind and parallel to the road edge guardrail. The entire shoulder was paved to and beyond the face of the guardrail and into the depressed gutter in front of the curb. Paving of the clearance area between the edge of the usable shoulder and the face of the guardrail would appear to be a very desirable contribution to safety.

Bridges

On the Interstate System bridges, safety walks 12 inches and often 18 inches in width were relatively common. The need for more than a brush curb 4 to 6 inches in width on bridges comprising the Interstate System is very questionable in my opinion. From a performance standpoint, the safety walk presents a verticle surface hazard at the entrance to the bridge and also can cause a vehicle to strike the bridge railing system at a higher elevation than would otherwise be the case. A nearly vertical wall with a small fillet section at its base is much to be preferred over the typical safety walk cross-section found on many recent projects.

Even though the standards of the American Association of State Highway Officials have been followed rather closely, the shoulder systems on these newest Interstate bridges on the nine State projects are largely inadequate for traffic needs. Only a few bridges of any length carried the full shoulder width. In one State there was undesirable variation in the width of successive similar bridges. Evidently, a design change that took effect for bridges designed within the Department was not applied to similar bridges on the same project which were being designed by a consulting engineering firm.

Median and side piers were given a wide variety of protective shielding to avoid having motorists contact them. In too many cases there was no protection whatever or only a few sections of guardrail placed in advance of the pier.

In contrast with the generally inadequate shielding of center and side piers, a fairly elaborate treatment was common at twin bridges where an Interstate