

Slopes

Flattening side slopes and rounding ditch bottoms to increase the safety of the roadside was not characteristic of most of the nine projects visited. Numerous situations were noted where, at least in localized areas, readily available embankment material could have been used to flatten slopes to 6:1, a slope that can be safely traversed by a conventional vehicle. Because grading costs are becoming a somewhat smaller part of the total project cost, much more attention should be devoted to examining slope adjustments as new projects are constructed. Savings in guardrail installations, maintenance, and possibly drainage features that otherwise would be required can be credited against dirt-moving costs associated with flatter slopes.

Lighting

It was previously observed that only four States installed roadway lighting on the Interstate projects visited. Of these four States, two used steel poles on transformer or flange bases mounted on concrete footings no more than 1½ to 2 feet off the outside edge of the paved shoulder. In Oklahoma and Rhode Island, the same lateral location was used but the lighting installation was somewhat less hazardous because frangible bases were employed on the exposed poles. The aluminum poles used were of a type shown by experience to break away at the flanged base without causing serious damage to the vehicle or its occupants. Where roadway lighting is employed, concrete footings should be kept to the ground level and the lateral clearance from the edge of the shoulder or face of curb increased above presently used minimums. The enthusiasm for maximum lighting efficiency and aesthetics has sometimes resulted in having the poles in target positions and undesirably close to the roadway. Longer mast arms are possible and with more powerful luminaires at higher mounting heights, fewer lighting standards are needed.

Summary of needs

In summary of the study of the nine Interstate projects selected essentially at random for this study, it can be said that several urgent needs remain to be satisfied if the Interstate System is to become as safe as the public interest requires. The following statements highlight these requirements:

I. Decisions on engineering design frequently have been based on first cost considerations rather than on a true cost effectiveness principle. Long-range economic demands suggest the high importance of choosing initial designs that will serve traffic adequately over the full life of the improvement at a minimum cost and with a maximum of safety. The maintenance and operating requirements associated with the various alternate designs are vital cost determinants that should receive more attention during the decisions on design.

II. When separate contracts or subcontracts are negotiated for installation of signs, lighting, guardrail, drainage facilities, and similar elements, a maximum of coordination is needed to insure that these several items and the features of the principal construction contribute in a unified way to the finally completed highway improvement.

III. Immediate steps should be taken toward a closer working relationship between bridge and roadway design engineers to achieve safer design conditions for the roadway entrance to bridge structures. Liberal evidence exists that the vertical element of the transition between roadways and bridges is one of the weakest features of present roadside design.

IV. Multi-disciplinary review teams, operating before, during and after highway construction, are an aid to crystallizing timely decisions on many items affecting the safety of Interstate projects. Teams should be composed of representatives from design, construction, traffic, maintenance and perhaps other divisions of the highway department whose views result in decisions that affect safety features. Supplementary assistance of personnel from the Bureau of Public Roads and other component units of the Federal Highway Administration, and from enforcement authorities has proved valuable. The functions of the team logically start in the earliest planning stage in the consideration of such items as sign locations, guardrail placement, and lighting installations. Teams should also be active during the construction period so that adjustments then found to be desirable can be made. Before the project is open to traffic, the review team should examine the final state of the improvement to insure that the highway is in fact ready for public