

the exception. A modern, well designed highway is a thing of beauty. By judicious planting and landscaping it can be adapted to the terrain and natural foliage so that it complements rather than detracts from the scenic grandeur. What we must guard against, however, is becoming too overzealous in our beautification efforts.

Aside from their ability to enhance a highway's appearance, trees are still a deadly menace to high speed traffic. Drivers and their unfortunate passengers are still being daily maimed and killed by trees on our highway system. In Texas, last year alone we recorded 788 accidents on our rural system involving trees and shrubs.

In no case should safety ever be compromised in the interests of beautification. No trees should be planted or permitted to remain within thirty feet of a main-lane shoulder or within twenty feet of a ramp. No trees should be planted or permitted to remain within medians less than seventy-five feet in width. Since over twenty-five per cent of highway fatalities result from vehicles leaving the road, trees should be removed on the outside within the limits of horizontal curves. Inside the curves, they should be removed or set back a sufficient distance so that they do not limit sight distance.

We have developed break-away mounts for our highway signs and illumination standards. Until such time as an artificial break-away tree is developed, they must be considered one of our major roadside hazards.

ABUTMENTS AND RETAINING WALLS

Since abutments and retaining walls must by their very nature be closer than thirty feet to the roadway, they must be continuous with no protruding features subject to collision. Desirably, they should be at least twenty feet from the roadway. If a closer location is required, protective guardrail should be installed. Retaining walls or abutments should not impair sight distance to ramp gores or signs. Retaining walls should, of course, be avoided if at all possible, thus resulting in a much more open, pleasing and safer facility.

UTILITIES

Utility installations are the nemesis of many highway engineers. They contribute nothing to the appearance, operation or maintenance of our system. The tangle of utility lines along many of our highways severely detracts from their appearance and they are a constant headache to our construction and maintenance personnel. Nevertheless, we must live with them, hence we must establish some basic housekeeping rules.

All overhead lines constitute a hazard by virtue of their supporting poles. Due to the massive size of H-frames and towers, they should be kept completely off the right of way except at extremely wide sections where they can be placed beyond any reasonable possibility of danger to traffic. Ideally, overhead lines should span the entire right of way with poles adjacent to or just outside the right of way line; however, if a compromise arrangement must be accepted, utility poles should be no closer than thirty feet to the main lane shoulders or twenty feet to the ramp shoulders. Electrical transmission lines, of course, pose the greatest danger to traffic since any accident resulting in a pole knock-down or damage could drop a "hot line" across the highway. Telephone lines do not pose this danger; however, because telephone lines cannot normally span as great a distance as power lines, their pole placement is a principal consideration.

Railroad signal devices such as gates, flashing lights, crossbuck signs, etc., constitute a menace to traffic due to their usual proximity to the highway at railroad-highway crossings. I might mention that Texas is currently engaged in a cooperative research study involving at-grade railroad crossings. It is our intent to try and develop a hazard rating of different types of crossings as well as determine whether railroad crossing signs and signals should be brought back into the family highway signs.

In municipalities, fire plugs and traffic signals can be quite hazardous. Most street sections are necessarily constructed on very restricted right of way with fire plugs, traffic signals, illumination standards, etc., located between the curb and sidewalk. All such installations should be located as far away from the roadway as possible, preferably beyond the sidewalk area.